History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	11/5/2011	**Date Available:**	11/05/2011
History Brief Date:	11/07/2011	**History Brief ID:**	VI-1111248346
Event Type:	Information	**In- Service Date:**	11/05/2011
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	11/07/2011
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	4th QTR S/D internal visual not full API 510 performed		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	TBEA
Save:		**Inspected By:**	TBEA

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

C-1100 internal dirty inspection only not full API510

SUMMARY:
C-1100 opened for process engineering to review 3 S/C draw off tray and impingement plate. API internal inspection due 2017. See PED report for information regarding the repairs made to number 1 sump and numbre 3 sump.
? PED Identified a potential opportunity to relieve some of the plugging in the 11PD003 region of the column that was observed during this run without installing the new stainless steel trays that had been purchased. PED noticed that there was a lot of plugging material in the 2? gap between the downcomer outlet and the entrance weir on trays 26-30. This could have backed up liquid in the downcomers and caused the elevated dP. After consulting with the BIN to make sure removing them wouldn?t cause a different issue, entered a TAW to have the weirs removed. It took only two shifts to remove these weirs.

DIRTY INSPECTION:
A dirty inspection was performed on this vessel except at tray levels 6-9 and 13-19.
At tray level 5 in the flash zone, the impingement plate for the inlet feed line was found bulged at varying locations up to approximately 3 inches and seeping an oily product. The impingement plate is approximately 7 foot in height and 25 foot in length. A detailed account on bugle locations and seepage will be forth coming once the vessel is cleaned.

History Brief

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Report Date: August 18, 2012 Data Source: Meridium

UT gauging of the impingement plate were taken at different courses of the plate with results from 0.240 inches to 0.230 inches in thickness. Nominal is believed to be 0.250 inches. The plate does not appear to be thinning or in danger of detaching from the internal lining at this time. UT grid documents can be found in inspection S/D files
1 S/C sump had about 3 one-inch holes in the bottom that were not expected. Similar holes were detected in 3 S/C last S/D, which led to problems drawing 3 S/C. Because of this, the shutdown team decided to do a very thorough repair on this sump. Due to time limitations, a full replacement with a new sump was not possible. Instead, we welded a 10 gauge carbon steel plate along the outside of the bottom and 8¿ up the sides of the existing sump which is also carbon steel. A UT (U.T. thicknesses of .10¿ to .12¿) thickness measurement was used to make sure the new plate was being welded to good, thick metal.
From the top head down to tray 19, the shell was found with a tightly adhered black residue up to .180 thick. Random areas on the shell were scraped clean for closer inspection at the top head and at each tray level (19-47). The top head was noted with general corrosion with pitting up to .03. The shell from trays 30-47 is lined with 410SS with less than .01 pitting noted and no mechanical damage observed. The shell at tray level 19-29 is 516 CS, light general corrosion with less than .03 pitting noted. The shell from tray level 10-12 is lined with 410SS with less than .02 pitting noted and no mechanical damage observed.
The bottom head was in progress of being cleaned at the time of inspection. Random areas were scraped clean with less .02 isolated noted. The vortex breaker was observed intact.
The shell from the bottom head up to the bottom of tray 5 was found with a tightly adhered black residue up to .180 thick with less than .02 pitting noted. JH

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	11/5/2011	**Date Available:**	
History Brief Date:	10/09/2011	**History Brief ID:**	EI-1110247229
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	11/05/2011
Asset Type:	251	**Inspection Type:**	EVI
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	API 510 EXTERNAL VISUAL INSPECTION		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron - General
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	General
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	TBEA
Save:		**Inspected By:**	

Reliability Comments:

API 510 EXTERNAL VISUAL INSPECTION PERFORMED BY JEFFREY SMITH ON 11-05-11

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	1/6/2010	**Date Available:**	
History Brief Date:	01/06/2010	**History Brief ID:**	EI-1001228534
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	01/06/2010
Asset Type:	251	**Inspection Type:**	EVI
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	API 510 External inspection insulation and deck repairs		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron - General
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	General
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	TBEA
Save:		**Inspected By:**	

Reliability Comments:

INFORMATION
An API 510 5 year external inspection was performed on C-1100. Overall the insulation is in fair condition and there are no major repairs required by this external inspection. There are a couple areas where the insulation has been removed near the top of the column where CUI is a concern due to the lower operating temperatures. I will identify areas of repair by identifying their proximity to nozzles or man-ways.
Starting at the base
1. Concrete or gunite coating at the base is damaged along the bottom edge on the south east sections. See pics below.
2. N22B insulation around the nozzle opening posses a safety hazard to people working in the area. See pics.
3. N39B insulation missing, too hot for CUI.
4. N41 weeping product onto deck and plugging deck drain and allowing water to pool. Clear hole and repair weep. See pics
5. Insulation missing on pipe guide to the west of MW4 on the same deck. Potential for wind to damage surrounding insulation, this area needs to be secured.
6. N11A insulation damage, too hot for CUI.
7. N10, out of service line to C-1140 is cold and insulated. Insulation should be removed to preserve pipe exterior and prevent CUI. If line was not freed of product line could potentially leak hydrocarbon product.
8. Deck near N8 needs to be repaired. The deck is thin near the edge and is pulling away from the structure. See Pics.
9. Repair insulation damage near MW2 above the deck. Potential for CUI is low, but additional damage by the wind is likely. See Pic.
10. Insulation damage on the deck where the injection quill resides and MW1 need to be repaired. Insulation near the top head is currently secured with 2 screws and needs to be re-installed and secured in place. See Pics.

RECOMMENDATIONS
1. Concrete or gunite coating at the base is damaged along the bottom edge on the south east sections. Repair concrete exterior. Perform UT scan from inside the skirt to ensure the skirt is not thinning at the base.
2. N22B insulation around the nozzle opening posses a safety hazard to people working in the area. Remove

insulation that posses danger due to sharp edges near the valve handle. Re-secure to column.
3. No issues at this time.
4. Insulation missing on pipe guide to the west of MW4 on the same deck. Potential for wind to damage surrounding insulation, this area needs to be secured. Secure insulation near and around the pipe support to ensure no further damage from the wind will occur.
5. N11A insulation damage, too hot for CUI.
6. N10, out of service line to C-1140 is cold and insulated. Insulation should be removed to preserve pipe exterior and prevent CUI. If line was not freed of product line could potentially leak hydrocarbon product. Remove insulation from this out of service circuit.
7. Deck near N8 needs to be repaired. The deck is thin near the edge and is pulling away from the structure. See Pics. Consult DED for repairs to deck.
8. Repair insulation damage near MW2 above the deck. Potential for CUI is low, but additional damage by the wind is likely. See Pic. Remove existing insulation and jacketing to support ring directly below this current void in the insulation. This area of the column operates in the temperature range where CUI is a problem and this ring needs to be inspected due to the unsealed area on the column. Contact FXD area inspector for additional information as needed.
9. Insulation damage on the deck where the injection quill resides and MW1 need to be repaired. Insulation near the top head is currently secured with 2 screws and needs to be re-installed and secured in place. See Pics. Re-attach the loose jacketing to avoid this piece coming free from the column and hitting someone on the ground.

Contact John Beauregard 2-5187 with questions or concerns.

**Material, Fabrication, Welding, Inspection and Testing shall be performed in accordance with the Richmond Refinery - Metals Craft, Quality Assurance Procedures.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	4/29/2009	**Date Available:**	04/29/2009
History Brief Date:	05/14/2009	**History Brief ID:**	VI-0905221065
Event Type:	Information	**In- Service Date:**	04/29/2009
Equipment ID:	C-1100	**Critical:**	
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	04/29/2009
Asset Type:	251	**Inspection Type:**	OTH
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	IR Survey of OVHD Line		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JHVJ
Save:		**Inspected By:**	JHVJ

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

Summary:
-Equipment operations details (process, material, parameters)
C-1100 Ovhd Reflux = 26.9 MBPD
C-1100 Total DP = 7.33 PSIG
C-1100 Ovhd Temp. = 284.3 °F
IR Scan Highest Temp = 458.5 °F (pg. 24)
Areas of concern = Overhead line
-Weather details
Avg. Ambient Temp = 54 °F
-Additional details
The IR Report also includes scans of some of the higher inlet/outlet side-cuts of C-1100
-Recommendations
Keep = add to schedule to be looked at by request
Please note that the temp recorded on the IR scan can be affected by distance, reflection/ radiation from surrounding equipment, and weather conditions (i.e. winds).

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	2/9/2009	**Date Available:**	02/09/2009
History Brief Date:	02/10/2009	**History Brief ID:**	VI-0902217380
Event Type:	Information	**In- Service Date:**	02/09/2009
Equipment ID:	C-1100	**Critical:**	
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	02/10/2009
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Combined H/B prior to 2009 in one document		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	TBEA
Save:		**Inspected By:**	TBEA

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

History:
All history briefs prior to 2009 are included in this document with dates attached.
TBEA

04/19/1983 INTERNAL / REPAIR
Flash zone area available for inspection due to required repairs to transfer line. Approx 50% of the tray bolts were corroded thin or had failed. Most of these bolts were replaced at this time. The bottom 4 trays, repaired or replaced during the 7-19-82 S/D, may also have the wrong bolting material and extensive work should be anticipated in this area next S/D. Not made available for inspection at this inspection date.

03/19/1984 INTERNAL / ROUTINE
Flash zone area at transfer line elevation made available for inspection only. Column was in good condition. Tray and bolting indicate very littlecorrosion taking place at this inspection. Only one tray inspected due toavailability.

8/05/1985 INTERNAL / ROUTINE
MAJOR S/D The column was steamed out and opened at all external MWs. The Internal MWs were opened only between trays 1-5 and 18-37. All areas available for inspection were visually and ultrasonically inspected (top head not gaged - no staging). Trays 19, 20, 21 and the collector tray below tray 19 were corroded thin (0.05" to failure). All

four (4) trays were replaced (mat'l is now 410 S.S.). The downcomers wre also replaced (holed through and thin throughout) (New downcomer mat'l and all bolting is 316L). The corrosion seemed to be the heaviest at the collector level.Close inspection of the shell (after trays had been removed) showed no loss of wall in this area. At least 1/2 of the bolts in trays 1-5 were severely corroded and near failure (wrong mat'l used at '82 S/D - see previous records). Several tray and downcomer angle supports (approx 10-12) were broken loose and distorted. Many weirs were missing corner brackets and the downcomers (center) between trays 1 and 2 were sagging in the middle cutting off almost all flow to the trays. Many (approx 200)tray clips were loose and out of position. These trays and downcomers (1-5) have been upset in the past and at best can now be described as being in only fair condition. Plans should be made (mat'l ordered) for the possible replacement of trays 1-5 at the next major S/D. The inlet impingment plate (flash zone) was found to be bowed out in (3) areas. The (3) bowed areas were carefully removed (air-arc) and the shell and cladding behind checked carefully for signs of corrosion -none was found.A layer of coke (3/8" thick) had built up behind the impingment plate. The bottom of the plate was completely welded allowing no drainage of trapped stock. New plate (approx 200 sq ft of 410 S.S.) was welded in place. A skip weld was used along the bottom edge (weld rod was E309-15 and all weirs were ground smooth. TOP HEAD: Top head was not UT gaged due to no staging (should be staged at next S/D) vapor horns UT'd 0.61" and 0.60" (6 to 10 MPY), sparger noz.0.66" - no loss. Top head nozzle 0.70" (13 MPY loss) a moderate layer of soft scale (approx 1/8" to 1/4" thick) covered the shell, tray and refluxpiping. TRAY 48: Moderate scale throughout. Tray thickness was 0.12" and sieve holes measured 0.480" dirty and 0.488" clean. Shell gaged 0.67" to 0.70".Replaced (1) upset flow dam and tightened (1) other. Corrosion coupon rack sent to mat'l lab and new rack installed. TRAYS 47-38: Not opened this S/D. CONICAL SECTION: Shell gaged 0.64" to 0.76". No significant corrosion. 10" reflux return noz. 0.56", sparger nozzles 0.56" to 0.61". No loss. No repairs required. TRAYS 37 TO 35: No significant corrosion seen. Mild cleaning of trays (scale and debris). No repairs. COLLECTOR TRAY (below TRAY 35): Cleaned approx 1" of scale and debris from downcomers. TRAYS 34 TO 22: No corrosion seen, mild cleaning of scale all trays. No repairs necessary. Tray thickness 0.14" max to 0.12" min. Sieve holes 0.475" dirty to 0.495" clean. 12" vapor return noz. at tray 22 gaged 0.75" (0.76" in 1982 - 3 MPY loss). TRAYS 21, 20, 19 and COLLECTOR TRAY below Tray 19: All trays replaced (corroded thin 0.07" to 0.09" and holed through in approx 8 to 10 areas).Replaced tray support beams also. Tray mat'l is 410 S.S., downcomer mat'lis 316L, all tray hardware (clips, bolts, etc) is 316L or 410 S.S. No significant corrosion to shell behind old trays. TRAYS 18 TO 6: Not available to inspection this S/D. FLASH ZONE: Replaced approx 200 sq ft of bowed inlet impingment plate (new mat'l is 410 S.S. - weld rod was E-309-15) bottom edge of plate was skip welded. The 32" tranfer line was internally inspected from the flashzone inlet to the 2nd 24" ells on the way to F-1100 A & B. One (1) pipe weld (eroded) was ground flush with the parent metal (approx 5" long). Approx 20 areas (within striplined sections) were found to have multiple pinholes. Reco to grind out and reweld the worst areas (each about 1/2"x 1" long) was deferred by engineering (Nick Lavanos) See piping book, Sys 2, Dwg 17 for location of problem areas and further information on this line inspection. UT range in Flash Zone Shell was 1.53" to 1.66". No significant corrosion. Corrosion coupon rack sent to mat'l lab for analysis and new rack installed (just inside manway at flash zone). TRAY 5: UT 1.66" to 1.78" - no corrosion. Rewelded (2) tray flanges. Lap patched two (2) holes (approx 1"x3" each) in collection pan. Replaced (3) tray retaining clips. Replaced two (2) bent and badly distorted angletray supports (new mat'l is 316L bolts). TRAY 4: Installed (4) downcomer supports (approx 4"x3"x1/4"). Replaced (2) broken angle supports (1/8"x2"x53" long). Replaced (1) overflow weir angle bracket and (2) bolts. Installed (4) downcomer supports. Replaced approx 100 corroded C.S. tray bolts with new 316L mat'l. TRAY 3: UT 1.62" to 1.75" - No loss seen. Straightened (1) manway angle. Replaced (3) angle supports (tray) (missing). Replaced 2 missing bolts (316L) at tray support beam to shell connection. Replaced approx 100 C.S.tray bolts with new 316L bolts. TRAY 2: Repositioned the sagging center downcomer and straightened (4) downcomer supports. Replaced (2) damaged corner angle brackets. Jacked tray #1 away from center downcomer and installed (4) new support braces. Replaced approx 100 C.S. tray bolts with new 316L bolts. Replaced (2) missing tray support beam bolts. TRAY 1: Weld repaired (1) cracked and distorted tray flange. Relocated south tray to shell connection and rebolted same. Rewelded the broken loose main beam connection to the shell (South end). Installed (2) missing corner brackets from overflow weir. Replaced approx 100 C.S. bolts (corroded) with new 316L bolts. BOTTOM HEAD: Vortex breaker was removed and cleaned (approx 30% plugged off). Bottom head noz UT 0.55" - no loss. Cleaned loose scale and debris from bottom head. Bottom head 1.88"-1.90" UT. NEXT S/D: Possible replacement of trays 1-5

due to many past upsets and repairs. Stage top head for UT inspection (no readings to this date). ADDITIONAL UT READINGS:1 S/C noz 0.58"; Cone Section - 10" ATCR return noz 0.56", 10" ATCR return noz (North) 0.56", 12" vapor returns (2) 0.70"; 2 S/C draw (24") 0.72"; 10" C-1130 vapor return noz 0.56; 8" 3 S/C 0.56"; 12" vapor return noz to C-1140, 0.70";8" (2) ABCR return from P-1148's, 0.59" and 0.60"; 4 S/C draw (20") 0.60"; 5 S/C draw (12") 0.56"; 5 S/C PA (6") 0.54"; 10" vapor return to v-1103, 0.54"; (2) 8" stripping stm (1st deck) 0.56", 0.54; 4" c-1160 O F return 0.54"; LT 11002" (1st deck) 0.54"; FT 1104 2" (1st deck) 0.64"

10/03/1988 INTERNAL / EXTERNAL / SHUTDOWN / INSP. DUE
THE COLUMN WAS OPENED AT ALL EXTERNAL AND INTERNAL MANWAYS. INSPECTION OF THE COLUMN SHOWED IT TO BE IN GOOD CONDITION WITH THE EXCEPTION OF TRAYS 35 AND 42 WHICH HAD SECTIONS BLOWN OUT OF POSITION DURING THE PLANT RUN. BOTH TRAYS HAD TRAY SECTIONS LIFTED OFF THEIR SUPPORT BEAMS WHICH WOULD HAVE PREVENTED THE TRAYS FROM HOLDING A LIQUID LEVEL. THE TRAY SECTIONS AND THEIR SUPPORT BEAMS WERE BENT AND REQUIRED STRAIGHTENING IN THE COLUMN AND REPOSITIONING. THE REMAINDER OF THE REPAIRS IN THE COLUMN WERE OF A MINOR NATURE WHICH INCLUDED NUTS AND BOLTS, TRAY CLIPS AND CLEANING. THE COLUMN OVERALL WAS FOUND IN A FAIRLYCLEAN CONDITION WITH ONLY MINOR CLEANING REQ. THE TOP TRAYS 48 THROUGH 36 REQUIRED VACUUMING AND SWEEPING TO REMOVE LOOSE SCALE AND DEBRIS. THE REMAINDER OF THE CLEANING WAS IN ISOLATED AREAS THAT HAD SLUDGE BUILD UP IN THE CENTER OR SIDE DOWNCOMERS. SOME MINOR HOLE PLUGGING OF THE SIEVE TRAYS WAS FOUND, PREDOMINATELY AT THE TOP SECTON OF THE COLUMN WHERE THE HOLE SIZE WAS REDUCED FROM ITS NOMINAL DIAMETER OF 1/2" TO 3/8". NO REPAIR WORK WAS RECOMMENDED TO ENLARGE THE HOLES AS THEY ARE IN ISOLATED AREAS. THE TOP HEAD AND TRAYS 48-44 HAVE APPROX. 1/16" OFSCALE ADHERED TO THE SHELL WITH ISOLATED AREAS UP TO 1/4" THICK. TRAYS 44-40 HAD 1/16 TO 1/8" OF SCALE ON THE SHELL. TRAYS 39 TO 33 HAD NO SCALE BUILD UP. TRAY 32 HAD 1/8" SCALE ON SHELL. TRAYS 5-1 HAD 1/4" OF SCALE ON THE SHELL. ULTRASONIC GAGE MEASUREMENTS WERE TAKEN AT EACH TRAY LEVEL AND ON THE BOTTOM HEAD AND NO SIGNIFICANT CORROSION HAS TAKEN PLACE SINCE THE PREVIOUS INTERNAL INSPECTIONS. THE TOP HEAD WAS NOT U.T. GAGED AS THERE WAS NO STAGING ERECTED AND INSPECTION FROM THE TRAY LEVEL INDICATED NO APPARENT CORROSION ALTHOUGH THE HEAD WAS HEAVILY SCALED. ULTRASONIC GAGE MEASUREMENTS WERE ALSO TAKEN AT RANDOM LOCATIONSON ALL TRAYS WITH NO SIGNIFICANT CORROSION EVIDENT. THE MINIMUM TRAY GAGE WAS 0.10". THE IMPINGEMENT PLATE AT THE FLASH ZONE WAS AGAIN BULGEDAWAY FROM THE SHELL AND THE STITCHWELDS ALONG THE BOTTOM WERE CRACKED. REPAIRS WERE MADE BY JACKING THE PLATE BACK AGAINST THE SHELL AND WELDING ALONG THE BOTTOM LEAVING 1" GAP IN THE WELD METAL TO ALLOW DRAINAGE OF ANY STOCK THAT GETS BEHIND THE PLATE. THE TOP TRANSFER LINE WAS INTERNALLY INSPECTED FROM THE COLUMN INLET NOZZLE TO THE FIRST VERTICAL ELLS ON THE 24" SECTIONS NEAR THE FURNACES. A LOT OF TIME WAS TAKEN UP BECAUSE THE CONTRACTOR HAD DIFFICULTY REMOVING WATER AND SLUDGE FROM THE LINE. THEY HAD TO BE SENT BACK SEVERAL TIMES TO REMOVE ADDITINAL WATER AND SLUDGE. THE FINAL INSPECTION WAS STILL MADE IN APPROXIMATELY 1/2" OF WATER. NO SIGNIFICANT EROSION / CORROSION HAS OCCURED SINCE THE LAST INTERNAL INSPECTION. THE FOLLOWING REPAIRS WERE COMPLETED THIS S/D: TRAY NO. 45 - REPOSITIONED AND TIGHTENED TWO LOOSE FLOW DEFLECTORS. TRAY NO. 44 - REPOSITIONED AND TIGHTENED TWO LOOSE FLOW DEFLECTORS NEAR THE INTERNAL MANWAY ON THE EAST SIDE OF THE TRAY. TRAY NO. 43 - REPOSITIONED AND TIGHTENED ONE LOOSE FLOW DEFLECTOR ON THE WEST SIDE OF THE TRAY. TRAY NO. 42 - REMOVED AND STRAIGHTENED TWO BENT TRAY SUPPORT BEAMS ON THE SOUTH SIDE OF THE COLUMN, STRAIGHTENEDFOUR BENT TRAY SECTIONS, REPOSITIONED THE SECTIONS AND RE-INSTALLED THE TRAY HOLD DOWN BOLTING. TRAY NO. 41 - BROKE THE FLANGE AT THE 10" NO. 1 S/C DRAW OFF BOX AND REMOVED APPROX. 1" OF STANDING WATER AND DEBRIS FROM THE BOTTOM OF THE BOX. REPLACED FOUR MISSING BOLTS ON THE SOUTH WEST CORNER OF THE CENTER DOWNCOMER BOX FROM TRAY NO. 40. TRAY NO. 35 - REMOVED AND STRAIGHTENED FOUR BENT SUPPORT BEAMS UNDER THE TRAY, STRAIGHTENED THE FOUR BENT TRAY SECTIONS,

REPOSITIONED THEM AND RE-BOLTEDINTO PLACE. TRAY NO. 34 - CLEANED APPROX. 1" OF BLACK SLUDGE FROM THE CENTER AND SIDE DOWNCOMER BOXES. TRAY NO. 20 - REPLACED EIGHT TRAY HOLD DOWN CLIPS ON THE NORTH SIDE DOWNCOMER FROM TRAY NO. 19. REPLACED FIVE MISSING BOLTS ON THE CENTER DOWNCOMER ADJACENT TO THE INTERNAL MANWAY. TRAY NO. 19 - CLEANED APPROX. 1" OF SLUDGE FROM THE CENTER DOWNCOMER. TIGHTENED ALL TRAY HOLD DOWN BOLTS. TRAY NO. 18 - CLEANED A 3" LAYER OF DIRT AND SCALE FROM THE TRAY. TRAY NO. 15 - CLEANED APPROX. 1" OF SLUDGEFROM THE CENTER DOWNCOMER. TRAY NO. 12 - CLEANED APPROX. 1" OF SLUDGE FROM THE CENTER DOWNCOMER. TRAY NO. 9 - JACKED UP THE 8" INLET SPARGER TO PROVIDE A NEW CENTER SUPPORT AND REGASKETED THE INTERNAL FLANGE. THE FLANGE CRACKED WHILE BEING TIGHTENED AND REQUIRED WELD REPAIRS TO THE SPARGER TO FLANGE ATTACHMENT WELD. FLASH ZONE - JACKED THE BULGED IMPINGEMENT PLATE BACK AGAINST THE SHELL AND WELDED ALL ALONG THE BOTTOM WITH THE EXCEPTION OF 3-1" WIDE AREAS FOR DRAINAGE. WELDING WAS DONE WITH INCO 182 WELD ROD. REPLACED THREE MISSING CENTER TRAY SECTION BOLTS. REPLACED TWO MISSING BOLTS ON EACH OF THE TWO CATCH BASINWEIRS. REPOSITIONED THE CENTER WEIR AND INSTALLED NEW WICKING WHERE IT HAD FAILED UNDER THE CHIMNEY ASSEMBLY ON THE WEST SIDE OF THE COLUMN. TRAY NO. 2 - REPLACED ONE MISSING TRAY HOLD DOWN CLIP AND TIGHTENED THREE OTHERS ON THE SOUTH SIDE OF THE COLUMN. REPLACED TWO MISSING BOLTS ON THE CENTER TRAY SECTION. TRAY NO. 1 - REMOVED SIX TRAY CLIPS FROM THE TRAY, CLEANED COKE BUILT UP FROM THE UNDERSIDE AND REPOSITIONED THE TRAY SECTIONS AND RE_CLIPPED. BOTTOM HEAD AREA - CLEANED THE BUILT UP BLACK SLUDGE FROM THE BOTTOM 1/3 OF THE VORTEX BREAKER SCREEN. NEXT S/D: POSSIBLE REPAIRS TO TRAYS 3 & 4 WHICH WERE SLIGHTLY BENT WITH GAPS IN THE PLATES IN THE SIDE DOWNCOMER AREA. IF THIS COLUMN OPERATES NORMALLY IT IS RECOMMENDED THAT IT BE GIVEN AN INSPECTION FREQUENCY OF TEN YEARS.

12/15/1988 level control alarm apparently malfunctioned

During 3 shift, V-1103 "flash drum" level control alarm apparently mal- functioned allowing 300 degree feed to go out the top of the vessel and into the C-1100 atmospheric column flash zone. Feed rates were lowered to 14 MBPD until the unit was under control. The following day, T. Musial (PED), and CRC performed a radioactive back- scatter test on C-1160 vacuum column. The results indicate the trays werein tact and there was no affect on the vacuum columnn. However, per our conversation with D. Cocke (Materials Engineer), there may be some warpage, distortion, and/or upset trays in the flash zone area due to material expansion and contraction during the stock cooling process. (300 degree feed stock was entered into the 700 degree flash zone.) There is no problem with corrosion or material cracking. Inspection requested T. Musial to look into the process of C-1100 to verify if there is any evidence of damage. At the time of this write-up, no feedback had been obtained.

08/29/1990 INFRARED IN FEED RATES FROM 180 TO 195M BBLS/DAY
4 Crude unit feed has been increased from 180m bbls/day to 195m bbls/day in an attempt to produce maximum jet, diesel, and gasoline production. While raising rates pic-1151 malfunctioned causing a minor upset. The unit is presently limited by p-11-1 feed pumps and the desalter pic 1151.

06/05/1991 EXTERNAL / REPAIR
C-1100 Atmospherec Column was Gamma scanned by PED. All trays were found intact and holding liquid. The only qustionable area was between trays 3 and 4 in the stripping section. Tray 3 showed absortion in the vapor space. Absortion is likely caused by tray distress or damage, possible from upset or leaking bubble caps. PED initially recommended an internal inspection of the stripping sectionof the column. Operations, Maintenance, and the Major Projects group determined that an internal inspection in this column would only be made if "More significant reasons arise", otherwide this work will be deferredto the next S/D in 10/94.

01/16/1992 CRUDE FD TK SLUGGED UNIT W/ WATER

The opportunity crude feed tank, (Arab Med), slugged the unit w/ water. Feed rates were reduced for 1 day to $200M bbl avg. There were no known equipment problems associated w/ the upset.

02/01/1992 GAMMA SCAN,POSSIBLE DAMAGE TRAYS 6,7,10 & 11 DMM
The column was gamma scanned. Trays 6,7,10 & 11 may have some minor damage to the sieve trays as they are not holding normal levels. No other problems found. Inspection cost $4000.

03/26/1992 FD TK SWITCH, UPSET UNIT FEED RATES,5 DAYS
C-1100 over pressured due to light product during a feed tank switch. The unit was upset, resulting in lowering rates to 180M Bbl/day for 5 consecutive days. The unit had a LPO of $600,000 based on a $2 profit per barrel of crude.

05/11/1992 GAMMA SCAN IND POSS COLL TRAY DMG ATCR SECT
C-1100 was gamma scanned after several upsets in the 2 S/C area of the column. Internal damage in the ATCR section, (below tray #35), may be present. See PED memo dated 5/8/92 for additional info.

11/11/1992 ELECTRICAL FAILURE, 5 DAY PLANT S/D
While working outside the plant, Contra Costa Electric Co. shorted out the electrical feed system to 4 Crude unit. The unit required a completeshutdown. After the electrical problem was fixed, it took 6 days to get the unit back on line. The delays were attributed to at least 20 equip leaks which required repairs. Each equip leak has its own history brief.

GAMMA SCAN IND POSS COLL TRAY DMG ATCR SECT DMM1992-05-11
C-1100 was gamma scanned after several upsets in the 2 S/C area of the column. Internal damage in the ATCR section, (below tray #35), may be present. See PED memo dated 5/8/92 for additional info.

ELECTRICAL FAILURE, 5 DAY PLANT S/D 1992-11-11
While working outside the plant, Contra Costa Electric Co. shorted out the electrical feed system to 4 Crude unit. The unit required a completeshutdown. After the electrical problem was fixed, it took 6 days to get the unit back on line. The delays were attributed to at least 20 equip leaks which required repairs. Each equip leak has its own history brief.

GAMMA SCAN, TOP 7 TRAYS DAMAGED DURING S/U DMM` 1992-11-26
During start-up after the power loss S/D, the top 7 trats were damaged & are not holding proper liquid levels. Now, all the 1 S/C is pulled from the 2 S/C draw. The upper part of the column is now ran flooded to pull all the jet from the 2 S/C nzl. A test run was performed in Dec. to det-ermine if an unsch S/D would be req'd to repair the trays. Not sure if the unit can produce on-test product during max mogas season.

PLANT S/D, P 1102'S WOULDN'T START 1993-01-31
The 4 Crude Unit s/d unexpectedly shortly after union/managment contract talks stopped, (The day before the contract expired). The P 1102's some how shutdown and the APS system circuit breaker was tripped. It took nearly 4 hours to locate the tripped circuit breaker. The unit returned to normal feed rates 3+ days after the S/D.

INT INSP DURING MAJOR T/A-REPL TRAYS 1-5,38-48.DMM 1995-10-23
EXTERNAL Insulation/Coating - The insulation covering was damaged at bottom manway with straps loose at various levels. Ladders/Platforms - The platform 18 deck was holed through in four spots, south side at ladder. (Safety Item.) The ladder cage supports were corroded through at various levels. (Safety Item.) A 2" steam line was jammed up against the cut-out at platform 23 at overhead line "Y". Ground Wire - Ground wire was attached. Skirt/Fireproofing - Vessel skirt showed no significant corrosion. Fireproofing was in place with small tight cracks and no spalling. Found'n/Supports - Foundation was serviceable with no spalling noted. Anchor Bolts - Anchor bolts were not visible.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Name/Data Plates - Name plates were secure and visible. SHELL & HEADS The column was opened to permit 10-year inspection and necessary repairs to damaged internals. Internally the column was very clean which indicates the potassium promaginate wash worked very well except it created quite a lot of sludge downstream in V-1160 and the C-1190 Stabilizer OH system. Visual inspection and ultrasonic inspection found the column to be in overall good condition with no significant corrosion found. The top head was not staged but little or no corrosion could be seen from the top tray. The upper shell and top head was covered with a light solf scale approximately 0.10" thick. The shell between trays 36-48 had mild general unmeasurable corrosion with scattered pitting to a maximum depth of 0.01". The shell was covered with a soft product type scale ranging from 0.03-0.10" in thickness. The shell between trays 22-35 had no visible corrosion except for some unmeasurable pitting at trays 25-27. The shell above the collector tray (above 18), through 21, had mild general corrosion with scattered pitting to a maximum depth of 0.01". The shell at trays 10-18 had no visible corrosion. The T-410 SS cladding between the bottom head and tray #18 was in satisfactory condition with no evidence of corrosion or disbonding. The transfer line was internally inspected. No significant corrosion was seen. A few small pin-holes were seen in the striplining, but external UT readings indicated no corrosion underneath. They were also present during the past 88 inspections and repairs were deferred. No repairs were made on the pinholes this T/A. Ultrasonic thickness readings were obtained on the shell (at each tray elevation) and heads. The UT readings indicate no significant corrosion except for the shell at Tray #4. The shell has a corrosion rate of 5-8.6 mpy (depending on whether you use the 85 or 88 inspection data). Worst case, if you use only the 88 inspection data, the shell has a remaining life of 5.3 years. Since visual inspection saw little or no corrosion and more thorough UT gaugings were obtained this T/A, it is likely that the corrosion rate is likely 5 mpy w/ 9 years remaining life to tmin. Inspect this tray area at half life or 5-6 years. INTERNALS C-1100 was opened because of known damage between trays 38-48 which were damaged on a previous plant start-up. Seventy-five percent or more of all the active tray panels between trays 38-48 were found upset, damaged, and laying on tray #37. New carbon steel trays were installed with stiffening bars, heavy duty clamps, and thicker friction washers were installed to withstand a 1 psi uplift. All of the minor and major support beams were severely damaged (blown upward) and were replaced with larger, stronger beams. The main truss beams were in satisfactory condition. Most of the center and side downcomers were reused. Totally new bolting was installed, all of which were heat treated to minimize sulfide cracking in the threads. Trays 47 and 48 were changed from T410 SS to carbon steel to prevent pitting in the wet, sour service. Trays 6-37 were found to be in overall good condition except for some minor mechanical cleaning in the side and center downcomers. The following was noted, but no repairs were made: Tray 34 was bowed up 3 inches; Tray 32 is sagging 2.5 inches; Tray 30 is sagging 3 inches. Several loose tray hold-down clips and bolting was tightened at tray 19 and 20. The chimney tray below tray 10 was missing four supports which required replacement. The collector tray above Tray 5 vapor hat on the west side had blown off and some of the T 410 SS panels were torn and required replacement. The flash zone transfer line impingement plate welds had cracked in several locations. It seems as if when it was originally welded together, there was no joint seam preparation. The plates were butted together and welded. The welds were ground flush leaving virtually no weld metal to hold the plates together. Once the main seam broke open, several other attachment welds away from the nozzle also broke. All were welded back together, well in excess of 20 linear feet. No damage was noted to the cladding. The overflow well was arc damaged during tray repairs and required rewelding. Trays 1-5 were in poor condition basically from operational upsets. These trays were very uneven and did not hold proper liquid levels. It was first decided to replace only the active tray panels, but once the panels were removed, it was noted that the main trusses were severely bent upwards. Initial straightening attempts sheared a tray clip from Tray #3 truss attachment. Since T 410 SS truss material was not readily available, it was decided to repair what we had. The truss support angle iron was cut and scab patched. The repair was considered very poor quality, but it was the best they could do in the available time frame. The repair significantly weakened the supports for these trays. Also, these trays have 885 imbrittlement which reduces their structural integrity. New trusses should be ordered for trays 1-5. The vortex breaker was in satisfactory condition except for some fouling. The breaker was cleaned before closing the column. CLEANING / SURFACE PREP METH The ultrasonic thickness readings taken indicate a nonsignificant metal loss except as noted in section 2. The final penetrant examination performed on the overflow thermowell repair was satisfactory. The penetrant and copper sulphate inspection for the side wall clip at tray 3 was satisfactory. The vessel was potassium promaginate, steamed, and water washed with additional hard cleaning needed at work locations. MISC./OTHER The strip lining in

the transfer line was weeping oil in several locations. This condition was noted in previous inspections and was considered not significant. Request for repairs was deferred. REPAIR IWO/EWO Numbers EWO #E301-E3 was issued to repair trays 1 to 5. Severe 880 inbrittlement interferred with straightening the strusses with the final condition of the finish trays having a 1-1/2" ..... between supports. Repairs were made to trays #6 and #7 by replacing loose bolting and tray panels; also reinstalling missing chimney hat supports. FUTURE WORK Have new supports on hand for trays 1 through 5 and collector tray.

C-1100 Pre-S/D Ext Insp, Top Ladr Cage Dmg/N17 Deck Corr, Minor Insul Dmg 2001-11-29
No details

S/D- Int Insp, Upgraded 9 Trays To 410SS, Tray 48 Rpl Due To NH4Cl Corr 2002-02-25
2/25/02 3:52:20 PM
Entered By Terry Gayer

SUMMARY (HISTORY BRIEF)
Internal Inspection during the 1Q2002 Shutdown

DIRTY INSPECTION:
The internal inspection was performed while the vessel was in a dirty condition, particularly tray 18 and above. This limited the quality of the inspection as only random areas cleaned with a hand scraper could be closely inspected.

1. EXTERNAL:
A-Insulation/Coating: An external visual inspection of C-1100 access structure (ladders & decking) was performed during the January 2002 unit shut down. The following items were found. Note: A separate list (IWO) was generated to address items requiring attention.
Inspection Summary: The access structure inspection revealed a general coating failure over the entire structure with localized areas of moderate to heavy corrosion. The non-skid coating found to be approximately 50% failed.1/2 to 1 gallon of scale and debris was noted on nearly all decks.
Specific's
Ladder # 1. No mechanical damage or distortions noted. The bolting, clips and safety bars were tight, intact and functional.
Platform # 1. The deck plates were distorted and holding water in several areas. No mechanical damage, loose bolting noted.
Ladder # 2. No mechanical damage or distortions noted. The bolting, clips and safety bars were tight intact and functional.
Platform # 2. The deck plates displayed minor distortion with standing water. No mechanical damage noted.
Platform # 3. (east side) Displayed minor distortion due to contact corrosion at the stitch welded seam. Distortion is approximately ?" to ?" above flush. (west side) Displayed no mechanical damage or distortions. The bolting and toe plates, handrails were tight and intact.
Ladder # 3. The bottom 2 bolts are broken. No other mechanical damage noted. The remaining bolts and clips are tight and intact.
Platform # 4. The deck plates, handrails and bolting are all tight and intact. No mechanical damage or distortions were noted.
Platform # 5. The toe plates east of the crossover to C-1130 displayed insignificant mechanical damage. No other distortions or damage noted.
Platform # 6. No mechanical damage or distortions noted. The bolting and handrails were tight and intact.
Platform # 6.5 and ladder. The deck. Ladder , safety rail, handrail and bolting were tight and intact.
Platform # 4 A/B. The rungs, clips, bolting and safety rails were all intact, tight and functional.

Platform# 7.7.5,8,9,and 10. These decks displayed no mechanical damage or distortions. The decks,handrails and bolting were tight and intact.
Platform # 11. In good mechanical condition. Slight buckling of deck plate noted. General coating failure with minor to moderate corrosion noted over all components
Ladder. Several cage attachment welds have corroded loose. General coating failure with minor to moderate corrosion over all components.
Platform #12. General coating failure with minor active corrosion. Isolated moderate to heavy corrosion along toe board. In good mechanical condition.
Ladder- Located moderate to heavy corrosion on cage stringers.
Platform # 13. General coating failure with localized moderate to heavy corrosion along deck to support contact points.
Ladder from deck 13 to 14 localized moderate to heavy corrosion on cage components. Several attachment welds have corroded loose.
Platform # 14. General coating failure with minor active corrosion.
Ladder from 14 to 15 General coating failure with minor active corrosion. Localized moderate to heavy at cage stringer attachment welds. Stringer is loose.
Platform #15. General coating failure with minor to moderate corrosion.
Ladder from 15 to 16. General coating failure with minor active corrosion. Localized moderate to heavy corrosion of cage fasteners.
Platform # 16 General coating failure with minor to moderate corrosion. 1st, 2nd, & 3rd plates are offset due to buckled plates causing possible tripping hazard.
Ladder from 16 to 17 General coating failure with minor active corrosion.
Platform # 17. General coating failure with minor active corrosion.
Ladder 17 to 18 Coating failure with minor active corrosion.
Half deck- Coating failure with minor active corrosion. Standing water noted around pipe penetrations.
Platform # 18. Coating failure with minor to moderate active corrosion.
Ladder 18 to 19- Coating failure with minor to moderate active corrosion.
Platform # 19. Coating failure with minor active corrosion.
Ladder 19to 20 - Coating failure with minor active corrosion.
Platform # 20. Coating failure with minor to moderate corrosion around bolting/ plate steel contact points.

In general the insulation & weather cover is in serviceable condition with several areas that need repair see the following areas.
1. 5 sq ft of missing /loose weather cover below nozzle N1A & N1B.
2. 2 sq ft loose weather cover at tray 34 pressure gage nozzle.
3. 2 sq ft missing weather cover south side about tray 22 area.
4. 10 ft missing cover on support ring and loose banding near nozzle N10.
5. Weather cover around N11 nozzle.
6. Loose weather cover around 3" nozzle near N12.
7. 2sq ft missing weather cover around N12.
8. 2sq ft missing weather near M4 manway.
9. 2sq ft missing weather cover around N42
10. 5sq ft missing weather cover near N14 & N15.
11. 4sq ft missing weather cover and loose band at N38 & N39.
12. Loose band at M5 manway.
13. 5sq ft missing weather cover at N17 nozzle.
14. 2sq ft missing weather cover at N28-N29.

B-Ladders/Platform:
Ladders/platforms in generally satisfactory condition except the loose risers on the ladder cage at the top deck and a heavy corroded deck plate at N17 nozzle.

C-Ground Wire:
Ground wire in satisfactory condition.
D-Skirt/Fireproofing:
Skirt and fireproofing in satisfactory condition with only minor cracking of the fireproofing.
E-Foundation/Supports:
General spalling off of the concrete around the foundation and anchor bolts.
F-Anchor Bolts:
General spalling off of the concrete around the foundation and anchor bolts.
G-Name/Data Plates:
Name plate & EQID tag in tact and readable.

RECOMMENDATION:
1. Repair insulation/weather cover as noted above.
2. Repair the cracked & broken welds on the ladder cage risers at the top level.
3. Replace the corroded deck plate at the level where N-17 nozzle is located

2. SHELL & HEADS:
A-Strp Lng/W'Olay/Coat'g :
The 410 SS from tray 18 to the bottom head was in good condition with no visible sign of damage and exhibited virtually no corrosion. The exception was trays 1-3 and 5 which had undercut(installation welding defects) at the downcomer vertical stay support stitch welds. These areas were copper sulfate tested and did not penetrate the cladding.
B-Unlined Surfaces:
Tray 48-32 The shell exhibited approximately 0.20 to 0.375" loose black product scale. Scraped areas of the top head and shell show no corrosion greater than 0.01" deep.
Tray 32-18 The product scale steadily lessened until it was much cleaner at tray 18. The shell showed no corrosion greater than 0.01".
Tray 18 to bottom - See lined surfaces.
C-Weld Seams:
All visible weld seams were free of visible defects and the weld caps surfaces were comparable to the shell.
D-Nozzles:
The accessible nozzles were clear debris and comparable to the shell, The pump around nozzles at the tray 16 were found to be in good condition with no corrosion of the exposed carbon steel shell. These two 6" nozzles were hot tapped through the shell and cladding some time in the '80s and the exposed carbon shell was not overlayed with stainless. This area was check by engineering in 1995 and was in good condition. A follow up check was recommended for this shutdown. No issues other than these two nozzles are not shown on the UT drawings.
E-Gasket Surfaces:
Gasket surfaces need cleaning.

3. INTERNALS:
Following PED investigation into the overhead line corrosion discovered this S/D a memo was issued regarding the temperature differential between C-1100 overhead temperature and the ammonia chloride sublimation point. (NH4Cl sub pt.)
Per the memo , a 25 F differential needs to be kept at all times to prevent the NH4Cl from forming and causing underdeposit corrosion. (Best Practice)

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

For an eleven month period prior to the 11/00 S/D the overhead temp was higher than usual, leading to a lower temp differential (AT) & causing NH4Cl to form. Cleaning the desalter (V-1102) during the 11/00 S/D improved its performance, lowering chloride levels & (raising) the AT.
It is believed that the NH4Cl that formed caused tray 48 in C-1100 to corrode, leading to its replacement and may also have contributed to the overhead line corrosion. PED will more frequently monitor the NH4Cl AT & will develop process guidelines to avoid this condition, monitoring will involve both online and nalco data obtained from the field.
(AT= delta T = Temp. differential)
A-Demister Pad:
None
B-Trays/Pans:
Tray-48 Heavily corroded. Approx. 1/4" of loose black product scale on tray, hardware and shell.
Approximately 2 sq ft of tray corroded through. Original 0.60" dia. Holes are now washed out in an elongated manner to 0.09". Tray 48 was replaced.
Tray 47 through 35-1/8" to 3/8"scale. Trays are in much better condition than tray 48. The visible hardware and tray supports were on serviceable condition. Tray 35 had two sections of blown out panel, Tray 35 through 37 were replaced with new 410 SS fixed cap trays per PED, so no action was required.
Collector tray below 35- The chimney covers were found to be damaged. IWO Cta02-33 was written to repair the chimney covers and this work was completed.
Tray 34 had slightly less debris. Tray and hardware were in satisfactory condition.
Tray 33 through 26 were dirty with 1/8" to 1/4" of loose scale and debris. The trays were slightly bowed.
Tray 33 through 31 were replaced with 410 SS fixed cap trays per PED.
Tray 25 through 22 were bulged upwards and displayed thinnung and metal fatigue. The diversion clips were corroded to near failure and were weakened beyond usefulness.
Tray 25 through 22 were replaced with new 410 SS fixed cap trays per PED.
Tray 21 through 19 were clean and smooth with little or no corrosion or mechanical damage. These trays had been scheduled for replacement, however they had been upgraded to 410 SS during a previous shutdown so no additional work was required.
Collector tray nelow 19 had approximately 1' of sludge in the downcomer and had broken chimney tray top braces. IWO Cta02-33 was written to repair the chimney covers and to remove the sludge and this work was completed.
Trays 18 through 10 were clean and smooth with little or no corrosion or mechanical damage.
Collector tray below 10 was in satisfactory condition with exception of sludge. The sludge was removed per PED recommendation.
Tray 9 through 6 were dirtier than the trays above but were found to be smooth with little or no corrosion.
Flash Zone (below tray 6) one of the vapor hats was blown off and the downcomer inside wall was distorted. The attachment welds on the inlet impingement plate were cracked and some welds between the plated were cracked as well. Some of the plates were bulged 3" to 4". An IWO was issued to remove and repair the effected areas of the wear plates, but action was deferred to a future date. IWO CTA02-33 was written repair the vapor hat and downcomer and this work was completed.
Tray 5 through 1 were in satisfactory condition. Enbrittlement was anticipated in this area but none was noted. The trusses and supports were a collection of splices and modifications. Truss repair was also anticipated, but they were found to be functioning effectively so no action was taken at this time.
C-Downcomers:
See tray and pans above.
D-Packing:
None
E-Internal Piping/Distributors:
The reflux inlet (tray 48) was covered with a thick black residue, plugging many holes. Hand scrapping revealed general pitting to 0.06" on the arms and up to 0.11" on the header. The bolting was in place and it was secure.
The top circulating reflux (tray 37) was in place and secure. The piping was dirty, but the wholes were round and open. No significant external corrosion was noted.

The bottom circulating reflux (tray 21) was in satisfactory condition with only minor corrosion to 0.03". No pitting or disruption was noted.
F-Baffles/Weirs:
See tray and pans above.
G-Vortex Breakers:
The vortex Breakers and screen were in place and secure. There was no significant corrosion noted

4. NDE:
A-Type/Extent:
UT survey of the shell , nozzles and trays was performed. All readings well above Tmin. Worst case UT is N3. 1995 UT was 0.92", 2002 UT was 0.79". Corr. Rate is 20.5 mpy. Remaining life is 28.7 years, 14 year 1/2 life (based on 0.13 t-min). Per the last inspection, there was extensive wasll loss expected in tray 4. Extensive UT was taken in this area and all readings were at or above nominal. There is a change in the shell thickness in this area (course 2 to course 3) and this may have led to misleading UT data in the past.
B-Results:
Nozzles A& B on field marked-up drawing were UT gaged. These are the 6" #5 s/c pumparound nozzles above Tray 16. UT gaging ranged .43-.48 for "A" nozzle (north side) & .43 - .46 for the "B" nozzle (east side) . Recommend gaging these nozzles at the next opportunity.

5. CLEANING
A-Method:
B-Surface Prep:

6. MICELLENOUS/ OTHER
INLET LINE - inspected the ID of the atmospheric transfer line to the end of the horizontal 90 down.
Marked up 12 areas where the welded or strip liner repairs hs penetrations. Several strips(3-4) showed bulges that may have trapped product behind them. Two small nozzles (one wasTW) showed bleed out, but couldn't determine if they were holed through or not. The last liner section down in the vertical section of the run showed 13 to 15 bleed outs, but could not be closely inspected. Several of the indications were areas where the strips were sealed with a single downhill pass if stainless, and they simply missed the edge of the strip. The surfaces of original unrepaired cladding were in serviceable condition. An IWO was written to remove insulation and perform thickness scanning over some of the striplined areas. UT data ranged from 0.35" to 0.44". There was no evidence that significant corrosion had occurred under the striplining. Since the bleed outs were similar to that noted during the previous two s/d's, no repairs were performed at this time. This area should be inspected at the next opportunity.

7. IWO' #

8. HYDRO-TEST:

9. FUTURE WORK:
The Reflux inlet at tray 48 has heavy OD corrosion and may require replacement at the next shutdown. The auto cad drawing is not correct. It is missing the two 6" #5 pump around nozzles at tray 16 and the trays are numbered incorrectly. The collector trays are not counted as trays on the original drawing. The drawing should be corrected to avoid future confusion.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

C-1100 Gamma Scanned, No Hardware Issues Noted, PED Analyzing 2002-08-19
No comments

S/D 2002-09-11
9/11/2002 2:54:18 PM
Entered By: Coral Miller

Major S/D: The column was ultrasonicaly and visually inspected after all external and internal m/w's were opened ultrasonic gage readings obtained at every tray level revealed no significant metal loss from previous inspection 3/78 visual inspection revealed the bottom 5 trays to be upset when column was opened. Extensive repairs had to be made to all 5 trays with several tray sections being replaced with 304 or 405 SS gage readings obtained on trays 19-21 revealed a 7 mpy corrosion rate for Tray 19 and a nil rate for Trays 20 and 21. The sieve tray holes on all three trays have enlarged from 0.55" to 0.60" on Tray 21 and 20 and from 0.57" to 0.62" on Tray 19. At the present rate of corrosion the trays should make a 2 yr run. Possible replacement next S/D. New tray sections are in interim storage.
Top Head: Top hd not UT gaged due to lack of staging. Vapor horns UT gaged 0.64" and 0.62". Sparger nozzle gaged 0.66". Top hd nozzle 0.74" moderate layer of scale on shell with no significant corrosion noted. Replaced 1 missing tray hold down clip.

Tray 47
Light layer of scale on shell. Cleaned approx 6" of dirt and scale from corners of both side D/C boxes. No major repairs required.

Tray 46
Light layer of scale on shell repositioned, 1 loose tray support crossmember, no major repairs required.

Trays 45-43
No repairs required mild cleaning on all trays.

Tray 42
Minor cleaning on tray. No repairs. The 14" vapor return nozzle UT gaged 0.96" min.

Tray 41-39
No repairs required. Minor cleaning on all trays.

Tray 38
Replaced 2 missing bolts in tray support beam, no major repairs.

Conical Section
No significant corrosion. 12" vapor return = 0.74", 10" reflux return nozzles = 0.60". Sparger nozzles gaged 0.52" on south side and 0.58" on north. No repairs required.

Trays 37-27
No repairs required. Mild cleaning on all trays.

Tray 26
No repairs. 10" vapor return nozzle gaged 0.60"

Trays 25-23
No repairs. Tray thickness and diameter of holes are same as previous inspection.

Tray 22
Replaced 1 missing tray wier and repositioned 1 loose wier located south side of center d/c box. Tray thickness gaged 0.13". Tray holes gaged from 0.50" to 0.525". 12" vapor return nozzle UT gaged 0.76" previous S/D gage reading 1.13". Check nozzle when plant comes down next.

Tray 21
Sieve tray thickness gaged 0.10". Tray holes gaged a max of 0.60". Possible tray replacement next S/D. The distributor piping gaged 0.51". The 2-8" reflux return nozzles gaged 0.60".

Tray 20
Tray thickness gaged 0.09". Tray holes gaged a max of 0.60". Possible tray replacement next S/D, no repairs this S/D.

Tray 19
Tray thickness gaged 0.09". Tray holes gaged a max of 0.62" possible replacement next S/D. No repairs required this S/D.

Collector Tray
Installed (3) 12" x 12" lap patches on failed tray sections tray UT gaged 0.10". Tray had approx 2' of sludge and dirt that had to be cleaned off before inspection.

Tray 18 to 7
No repairs requried this inspection.

Tray 6
Repositioned buckled center D/C box cleaned light layer of dirt and debri from tray.

Flash Zone
Tray out of position when column was opened. All upset tray sections were repaired. Rewelded cracked impingement plate attachment welds. The 32" inlet nozzle that falied 3-13-82 was weld built and ground smooth using E-502-15 rod with the final pass being made with E-309 MD. Line was stress relieved at 1325-1400 deg F for 2 hrs after all repairs were made (see EWO #L-432-<1> 13 S/D folder).

Trays 5-1
All upset trays were repaired with some tray sections replaced with 304 or 405SS. Shell appeared to be in good condition with only a light layer of scale noted.

Bottom Head
Mild scale on shell section. Removed the coke deposits from vortex breaker and two bottom rams horns. Cleaned loose nuts, bolts, dirt and debris from bototm hd. Btms nozz UT .052" - mating ell internally SS alloy weld overlayed.

Next S/D
Possible replacement of Trays 19-21 and collector tray below 19. The nozzle on Tray 22 should be UT gaged, possible repairs may be required. All internally clad nozzles were visually inspected and no corrosion or erosion was noted. All corrosion coupons were delivered to materials lab. Did not install replacement coupons.

S/D 2002-09-11

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

9/11/2002 2:47:41 PM
Entered By: Coral Miller

Plant S/D due to leak at 32" nozzle to transfer line weld. Nozzle internal cladding seal weld failed 360 deg at carbon steel nozzle to 5 cr piping connection. Installed 360 deg /zpp patch over failed and thin weld. Make permanent repairs during the 5-1982 S/D. Radiographed cladding welds for 5 s/c, flash drum vapor inlet, bottoms outlet and 18th Tray by-pass nozzles. All welds were OK. Inspect all cladding and lined nozzles during 5-1982 S/D. The 20" 4 s/c nozzle UT gaged 0.58 RWT.

S/D-Internal Inspection/Int Fire/Minor Repairs Reqd 2002-09-11
9/11/2002 2:07:18 PM
Entered By: Coral Miller

Major S/D: The column was steamed and opened at the top and bottom. Air was blown thru the column to cool it down. Approx 2 hours later a flame-less fire broke out in the column due to pyrophoric iron sulfides. The column was then water washed for approx 48 hours allowing the iron sulfides to oxidize at a controllable rate. All external and internal manways were opened for inspection. We UT gaged and inspected at every tray level using 2 or 3 - 2 man crews. It took approx 32 hours.
Top Head - moderate scale over like new parent metal in shell section. Top head was not gaged due to no staging. The vapor horns (2) and spargers were in good condition. The 8" sparger header gaged 0.66" min.
Tray 48 - moderate scale. Sieve tray holes gaged 0.49 and 0.50". No corrosion noted.
Tray 47 - Ditto
Tray 46 - Ditto
Tray 45 - Ditto
Tray 44 - Ditto
Tray 43 - Ditto
Tray 42 - Ditto, the 14" vapor return nozzle gaged 0.97" min wall.
Tray 41 - mild scale. No corrosion. 1/2" layer of mud in total draw off tray was removed. The 12" total draw off nozzle gaged 0.60" min wall.
Tray 40 - mild scale. No corrosion. Sieve tray holes gaged 0.50"
Tray 39 - Ditto
Tray 38 - Ditto, 4 missing "I" beam tray support bolts were replaced.
Transition Section - mild scale. No corrosion. The 12" vapor return nozzle gaged 0.72". The 10" reflux return nozzle gaged 0.60". The 10" reflux sparger gaged 0.54" - 0.61" on the south and 0.58" - 0.63" on the north side.
Tray 37 - mild scale. No corrosion.
Tray 36 - Ditto
Tray 35 - Ditto
Collector Tray - ditto. Small scale deposit on the north half of tray was removed.
Tray 34 - mild scale. No corrosion.
Tray 33 - Ditto
Tray 32 - Ditto
Tray 31 - Ditto
Tray 30 - Ditto
Tray 29 - Ditto
Tray 28 - Ditto
Tray 27 - Ditto
Tray 26 - Ditto The 10" vapor return nozzle gaged 0.58" min.
Tray 25 - mild to moderate scale noted.
Tray 24 - moderate scale noted. Some reduction in sieve tray holes due to scale 7/16" dirty 9/16" clean, this sale and corrosion on the trays gets worse until Tray 18.

Tray 23 - moderate to heavy scale. No corrosion on the shell. Original thickness of tray was 0.14" and now 0.135" corrosion rate 3 mpy. Original sieve tray holes was 0.50" dia and now 0.52" dia.
Tray 22 - heavy scale. 12" vapor return nozzle gaged 1.13" min. No corrosion on the shell noted just heavy scale. Sieve tray original thickness was 0.14" and now 0.125" corrosion rate 9 mpy. Sieve tray holes gaged 0.53" clean and approx 0.375" dirty.
Tray 21 - heavy scale. The 2' - 8" reflux return nozzles gaged 0.59" the reflux distributor gaged 0.51". No corrosion on the shell noted. Sieve tray gaged 0.108" thickness corrosion rate 19.2 mpy. Sieve tray holes gaged 0.546" dia.
Tray 20 - 1/10" scale on the shell no corrosion noted sieve tray gaged 0.09" thick corrosion rate 25 mpy. Sieve tray holes gaged 0.55", orig was 0.50". (Note in margin: 3.6 years total failure.)
Tray 19 - 1/16" scale bonded very tight to shell. Corrosion very bad on bolts, down comers, and tray. Sieve tray gaged 0.09" thick corrosion rate 25 mpy. Sieve tray holes gaged 0.565" dia.
Collector tray - general corrosion on tray and components at 13.2 mpy tray gaged 0.110". No corrosion noted on the shell. The collector draw off was not working before the shutdown. Approx 6" sludge noted on this tray.
Tray 18 - type 410SS cladding starts 12" above this tray. The shell above the cladding has 1/4" sludge and scale with no corrosion noted. The sieve tray is like new.
Tray 17 - no scale no corrosion, (1) one cracked tray support ring skip weld was repaired.
Tray 16 - Ditto except (2) two cracked skip welds were repaired.
Tray 15 - Ditto except (10) ten cracked skip welds were repaired.
Tray 14 - Ditto except (5) five cracked skip welds were repaired.
Tray 13 - Ditto except (19) nineteen cracked skip welds were repaired.
Tray 12 - mild scale no corrosion. Sieve tray holes measure 0.50".
Tray 11 - Ditto, 2" hot tap on south west side was not completely drilled thru. The hot tap was finished off and the cladding welded to the nozzle.
Tray 10 - mild scale no corrosion.
Collector Tray - mild scale, no corrosion. Approx 2" of sludge build up was removed.
Tray 9 - mild scale no corrosion. The 6" distributor pipe flange was replaced at the first flange from the column shell.
Tray 8 - no scale or corrosion.
Tray 7 - Ditto
Tray 6 - Ditto
Tray 5 - Ditto, north manways on internals were not opened for inspection.
Collector Tray - no scale or corrosion. 3 hold down bolts and 1 clip was missing and replaed. The 32" feed inlet gaged 0.38" min.
Tray 4 - Ditto Tray 5
Tray 3 - Ditto
Tray 2 - Ditto
Tray 1 - Ditto
Bottom Head - cleaned 6" mud and water, tack welded vortex breaker.
Column External - UT gaged rams horns all okay. Air tested TE-11051 thermowell nozzle at 10 psig.
Recommended installation of non skid surface on all deck plate around the column.
Column Internal - all sieve trays and holes were cleaned of scale deposits. Removed down comer inlet weirs on Trays #14 thru #18, #22 thru #24 and #26 thru #32 this shutdown to promote more column thru put. This in combination with the original design leaves Trays #47 thru #14 without inlet weirs. Bypassed Tray #18 and #34 by cutting their outlet weirs, blanking off 34" of sieve holes and installing a vapor riser on each internal manway of Trays #18 and #34.
Next Shutdown - replacement of sieve Trays; #19, #20, #21, #22 and collector tray above Tray #18 with an alloy SS should be considered due to high corrosion rates. Also consider strip lining the shell in the same area if corrosion warrants.

I.R.scan of injection area 2004-01-29
I.R. scan of injection point area for cool spots that may indicate corrosion

I.R. scan of injection area 2004-03-31
I.R. scan to look for cool spots that may indicate corrosion
ATCR Return Area Flooding Per Gamma Scan, Losing # 4 S/C 2004-06-17
The 6/17/04 RSC report notes the following results for the gamma scan conducted on 6/15/04:

ATCR Return Area Flooding Per Gamma Scan, Losing # 4 S/C 2004-06-17
"Preliminary gamma scan results indicate flooding in the ATCR section of C1100. The loading and dumping of this section of the column could be part of the cause for loss of 4 S/C. To address this we are raising column pressure. We will be holding feed stable at 245 MBPD while we test for the next few days. We will not be doing mudwashes until stable operation has been confirmed on C1100. The scan indicates the trays in stripping section of C1100 are no longer holding a liquid level. This data is consistent with high slop oil rate off C1160 which has been observed since the startup. (See PE notes for follow up steps.)"

Will continue to monitor this for further developments.

I.R. scan of injection area 2004-09-29
J.George requested injection point I.R. scan this was done last in January

Four Of Six Ladder Clips To Colum Lose, 2nd to 3rd Platforms Down @ North Side 2004-10-07
Four of the six retaining clips fastening the ladder from the 2nd to the 3rd deck down on the north side of the column have broken loose and require repair. A recommendation ( ) was written for repair.

Injection point I.R. scan 2004-10-11
I.R. scan of injection point looking for area's cooler thinking it's corrosion acting as insulation

CUI Found 200' Elev On H2O Inj Nozzle Platform, Reco'd For Insul Rmvl/Rpr 2004-10-12
An area of damaged insulation ~3' high by ~15' long was noted on the west side of C-1100 just above the 2nd insulation ring down from the top. The area is accessible from the overhead line water injection nozzle access platform. An area of the shell was checked for CUI, scaling and CUI to ~ 1/4" thick was found. UT gaging of a representative area was 0.66" (originally 0.68"). An inspection recommendation to remove the insulation, check for CUI, repair as required, and reinsulate/seal the area will be sent via the new IR work request system. The area temperature was approximately 250 plus deg F.

5 Year External VT/CUI Insp, Reco'd For Decking/CUI Issues2005-01-11
A 5 year visual and CUI inspection was performed on C-1100. The following was noted:
Top deck: N21 (top bleeder) insulation needs sealing; ladder/cage/railings have external corrosion.

2nd deck (south): No issues.

3rd deck (south to southwest): Seal M-1 and N2; remove insulation from N2 (runs about 100 deg F metal temperature).

4th deck (west): Strip / inspect / reinsulate 2 areas: one above 1st vacuum ring running south to west (about 1' high by 15' long); the other above the second vacuum ring (1' H x ~18' long in two locations). Seal N1A/N1B.

5th deck (southwest): Seal N3, N4, PDT-001. Seal 2 holes in insulation cover (west & southesast).

6th deck (south): Seal N5A/B, N6A/B, M-2.

7th deck (southeast): Minor damage noted on insulation cover between column and deck sill.

8th deck (southwest): Seal PDT-002, N7; patch ~ 1' sq area at PDT-002.

9th deck (south): Seal N8; Deck plate section at ladder has corroded through, needs replacement.

10th deck (northeast): Seal N9.

11th deck (south): Seal N10 and repair damaged insulation above vacuum ring below N10; repair gap between C-1110 top deck and deck 11.

12th deck (northeast): Seal N11A/b & patch ~6" sq area above broken ladder to deck 16; broken access ladder to deck 16 previously recommended for repair.

13th deck (south): Seal M-3 & patch 10" sq area below M-3; patch around supports for deck 11.

14th deck (southwest): Seal N12 & two PDT-003 nozzles; patch 3 areas: ~ 2' sq at N12 & (2) ~10" sq areas at PDT-003 nozzles.

15th deck (southeast): No issues.

16th deck (northeast): Seal N44 & N45; seal 2 gouges in insulation cover (~ 2' long) on east side of column.

17th deck (south): Seal N13; patch ~ 1' sq at PDT-004 nozzle; patch small holes @ N13.

18th deck (north): Seal M-4; patch 10" sq area above & 10' to right of M-4.

19th deck (northeast): Seal N41 & N42 (LT-051 nozzles).

20th deck (south): Seal N14 & N15; patch (2) 8" sq areas: one above & to the right of N14, one at N40 (TI nozzle); seal small holes near N40.

21st deck (northeast to north): Seal & patch (8) TI/PT nozzles (~ 2-3 sq ft).

22nd deck (south to west): Seal N17 & N35A/B; patching required around N35A/B (~6 sq in). Repair corroded deck plate on southwest edge of deck.

23rd deck (south to east): Seal M-5 & ~10 - 15 small gouges in insulation cover (~ 1" - 2" in diameter). Remove 3 sharp tears/gouges in deck plate near ladder (tripping hazard).

24th deck (west): Reinsulate and seal 8" steam inlets (N19 A/B); patch ~ 1' sq @ N18.

25th deck (southeast): Seal LT nozzles N22A & N24.

26th deck (south, also 1st deck up from grade level): Seal & patch ~ 2' sq around LT nozzles N22B and N23; clean up oil spill (safety hazard).

The above was put on an OTR recommendation for repair on 1/11/05. -jmg

I.R. scan of transfer line below injection point2005-03-29
I.R. scan / heavy scale on exterior of line causes I.R. images to look poor.. Scale should be removed

Temp Betweem #4 & #3 S/C >550 degF, Reco'd To Cut Cookies/UT/IR Gun 2005-09-15
It has been determined that the temperature of C-1100's shell is greater than 550 degF above the stopping point of the 410SS cladding at the tray 18 sidecut draw tray (# 4 S/C). In order to determine exactly where the temperature drops below 550 degF, it will be necessary to cut cookies, use a temperature measurement device, and UT gage between # 3 and # 4 S/C draw-offs. A reco was written (REC-46973) in order to have the work completed.

Temps/UTs Between # 3 & # 4 S/C By RAT, Temps >550 F Above # 3 s/c, UTs OK 2005-09-21
A single vertical row of 18 cookies was cut from just above the # 4 S/C draw nozzle (N12) to the level of the # 3 S/C draw nozzle (N9) and four additional cookies were cut above the # 3 S/C draw nozzle to determine if the metal temperatures are above the threshold limit for sulfidation corrosion (limit is 550 deg F) and to obtain spot UT gagings for the same.

Temperatures ranged from 648F just above the # 4 S/C draw nozzle to 547F above the # 3 S/C draw nozzle. There were some significant variations within the sampling points (actual range was 648F to 514F about 1/2-way between the two nozzles). These are above or right at the sulfidation corrosion limit.

UT gagings taken varied from 1.10" just above the # 4 S/C draw nozzle to 0.89" above the # 3 S/C draw nozzle. These were slightly higher than the last recorded gagings (2/02) which ranged from 1.02" to 0.84" in the same general area. It should be noted that only a very small percentage of the total area subjected to sulfidation corrosion was inspected.

The locations of the cookies are well-known and further inspections will take place both prior to and during the 10/06 shutdown.

I.R.survey looking at injection point and trans line2006-02-15
trans line has exterior scale, some thermal images show areas of interest

1Q07SD Int Insp, New Trays/Internals, Trays 47&48 Corr/Rplc'd 2007-05-21
An Internal visual inspection was performed during the 1Q07 scheduled shutdown:
? Trays 1 ? 5, 26 ? 30, 35 ? 37 replaced (planned work)
? Trusses for trays 1 ? 5 replaced with trays
? ATCR internal piping and trays 47 & 48 replaced (corrosion)
? Stripping steam spargers replaced (planned work) with new clips to shell (see NDE notes below)
? The wear plate assembly has cracking along the entire top and 6? of the left-hand side; hold-down clips installed
? Striplining on inlet nozzle and piping unchanged
? No corrosion noted at # 5 S/C return stub-in nozzles N44 & N-45
? See PED/DED shutdown reports for additional information

Shell and Heads
A) Strip lining / Weld overlay / Coating
Transfer line (ML/JG): The transfer line strip lining repairs were inspected visually to the vertical 32? ell at TML # 19 (see inspection isometric drawing # 0955-002-021). Oil was noted leaking out of several strip lining attachment weld defects as recorded in previous inspections; mechanical defects and dings from the original installation were still

visible with no erosion/corrosion seen. No other issues found and no repairs required as during previous inspections. See digital photos taken on 2/26 and 2/27/07.
Feed Inlet-Circumferential Baffle-Wear Plates (KG/JG): The feed inlet internal piping had no notable defects or corrosion. The circumferential baffle horizontal plate was found warped ~1/2? up and down along its length, the gussets and attachment welds had no cracking or other issues. The upper attachment welds for the vertically-aligned wear plates were found cracked along the entire length and approximately 6? down the side of the western most plate attachment weld. Additionally, the vertical seal welds between the plates were found cracked and weeping oil at five locations, including a crack on one of the wear plates themselves; bulging was also noted at the bottom of the wear plates. These were recommended to be ground out and repaired on TAW-7171; instead, EWO # BE 301-E11 was written to install a series of 10 angle clips to prevent the wear plates from falling if the welds completely failed. Recommend replacing the wear plates and reorienting them horizontally as in C-1160 next shutdown.
B) Unlined Surfaces
Top Head to Tray 46 (KG): Much of the top head was covered by a very thick scale. The scale was soft and easily scraped off for inspection of the head. Very little corrosion was noted throughout this area. Some minor pitting to as deep as 20 mils is seen but has been noted in past histories. At the time of inspection trays 47 & 48 had been completely removed and had not been re-installed. These trays exhibited heavy corrosion.
Tray 45 ? 35 (SE/CH/DD/RN): Internal inspection reveals residual product build-up on the shell, top and bottom heads. Residual product scale 12-15 mils thick noted on trays starting from tray 48 to 35. Areas physically cleaned and visually inspected at each tray with light measurable corrosion .010? with a few pits to 0.02?. No distortion, bulging, or notable corrosion was found. The shell from trays 48 through 35 has scattered loose soft blistering scale measuring ~3/16" thick but no significant corrosion was noted (~0.01).
Trays 34 ? 19 (DD/RN): Same as Tray 45 ? 35; a dark grayish scale with occasional rust flashes from liquid accumulation during shutdown. See ?Trays/Pans? below for details on internals. Only minor pitting noted as above. The clad / non-clad interface exists below the collector tray above Tray 18 and is visible inside the sumps for the collector tray. Access was difficult for UT (see NDE notes below).
Trays 18 to Bottom Head (KG/JG/RD): The 410SS liner exhibited no defects other than occasional mechanical dings and minor dark-colored scale. No notable pitting or any corrosion present.
C) Weld Seams (KG/RD/CH/DD/RN/RK): Weld seams were found full-profile with no appreciable erosion or corrosion.
D) Nozzles (KG/RD/CH/DD/RN/RK): Nozzles were found free and clear of excessive fouling; sludge build up was noted on 10" draw (N4) and in some others, this was cleared out prior to closure. Some had residual liquid in them following blinding. Nozzles N-44 and N-45 were inspected to ensure no corrosion was occurring between the cladding and the exposed shell (they had been installed flush with the shell OD about 1991 and the carbon steel shell edges exposed by the holes was not protected by overlay or lining following installation). Minor pitting to ~0.01? was noted on some of the manway barrels. Nozzles N1A/B (overhead outlet) were visually inspected, only minor ID and internal OD corrosion was noted; this was a concern since major portions of the overhead line were being replaced with Hastelloy C-276 lined carbon steel piping due to internal corrosion. The top vent (N21) was covered with scale but no corrosion was found by UT.
E) Gasket Surfaces (KG/RD/CH/DD/RN/RK): Only minor mechanical damage less than 0.01? was noted and no repairs were required on any of the manway nozzle gasket surfaces.

Internals
A) Demister Pad: N/A
B) Trays / Pans
Trays 48 through 35 (RD/SE/CH/KG/DD/RN): The 8" reflux distribution header is covered with thick scale (~1/4") but the distribution holes appear to be clear. Sections of trays 48 and 47 have begun to corrode to failure and should be replaced to ensure a five year run. Note 2002 inspection notes indicate that tray 48 was replaced. (These two trays were replaced this shutdown; # 48 with Monel, # 47 with CS - jmg) Also the center downcomer panel for tray 46 has holed through and should also be replaced. Trays 35 ? 37 were replaced in-kind (except for larger downcomer areas) per EWO # 1627 (planned work).

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Trays 34 through 10 (DD/RN): Trays had a light, flaky grayish scale/residue that partially plugged the holes (especially on tray 25), this fouling tendancy decreased the further one went down the column. The downcomers walls and vertical internals were clean; the collector tray (#19) had ~ ? barrel of sludge in the troughs. Trays 30 ? 26 were replaced in-kind per EWO # 1555 (planned work).
Trays 9 to 1 (KG/JG): The trays were completely removed in order to install new stripper trays and truss supports (trays 1 ? 5); trays 9 ? 6 were reinstalled after cleaning.
C) Downcomers: See above information on trays. The downcomer seal pan for tray # 26 had two holes about ~18? from either end; a plate was installed over the existing bottom and screwed in place (see EWO # BE301-E12). Some of the downcomers had sludge/scale in them; they were cleaned out prior to final closure.
D) Packing: N/A
E) Internal Piping: ATCR internal distributor piping was found corroded and plugged at the top of the column; the piping and the matching mating flange on the internal portion of the nozzle were replaced in-kind. The stripping steam spargers were replaced per EWO # 1542 (planned work). The 6? meter pipe and the two 9? overflow pipes from the bottom of tray 6 to the collector tray were found bent and mechanically damaged and were repaired per EWO # BE301-E13 R1. The distributor piping on trays 37, 21, & 9 were found unfit for continued service and were replaced per EWO # BE301-E7 R1.
F) Baffles / Wiers: See tray

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	6/4/2007	**Date Available:**	06/04/2007
History Brief Date:	06/07/2007	**History Brief ID:**	VI-0706177234
Event Type:	Inspection	**In- Service Date:**	06/04/2007
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	06/04/2007
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Insul Rmvd From Top (N21) Nzl, No CUI Found		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron - General
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Nozzles
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	JMJG

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

Following a recent incident at the Pascagoula refinery, we had the insulation removed from around the top 3? vent nozzle on C-1100 to inspect for possible CUI.
The nozzle was very well insulated and no corrosion was found. See the picture in "reference documents" for more details. The nozzle will be reinsulated on a routine basis.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	1/15/2007	**Date Available:**	02/16/2007
History Brief Date:	05/21/2007	**History Brief ID:**	VI-0705175814
Event Type:	Failure	**In- Service Date:**	03/31/2007
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	02/16/2007
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	1Q07SD Int Insp, New Trays/Internals, Trays 47&48 Corr/Rplc'd		

Reliability Analysis:

Event Type:	Failure	**Worked Performed By:**	Chevron - General
Cause Category:	Operations	**Program Status:**	
Effect Category:	Corrosion	**Maintainable Item:**	Internals
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	JMJG

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

An Internal visual inspection was performed during the 1Q07 scheduled shutdown:

- Trays 1 - 5, 26 - 30, 35 - 37 replaced (planned work)
- Trusses for trays 1 - 5 replaced with trays
- ATCR internal piping and trays 47 & 48 replaced (corrosion)
- Stripping steam spargers replaced (planned work) with new clips to shell (see NDE notes below)
- The wear plate assembly has cracking along the entire top and 6' of the left-hand side; hold-down clips installed
- Striplining on inlet nozzle and piping unchanged
- No corrosion noted at # 5 S/C return stub-in nozzles N44 & N-45
- See PED/DED shutdown reports for additional information

Shell and Heads
A) Strip lining / Weld overlay / Coating
Transfer line (ML/JG): The transfer line strip lining repairs were inspected visually to the vertical 32" ell at TML # 19 (see inspection isometric drawing # 0955-002-021). Oil was noted leaking out of several strip lining attachment weld defects as recorded in previous inspections; mechanical defects and dings from the original installation were still visible with no erosion/corrosion seen. No other issues found and no repairs required as during previous inspections. See digital photos taken on 2/26 and 2/27/07.
Feed Inlet-Circumferential Baffle-Wear Plates (KG/JG): The feed inlet internal piping had no notable defects or

corrosion. The circumferential baffle horizontal plate was found warped ~1/2" up and down along its length, the gussets and attachment welds had no cracking or other issues. The upper attachment welds for the vertically-aligned wear plates were found cracked along the entire length and approximately 6' down the side of the western most plate attachment weld. Additionally, the vertical seal welds between the plates were found cracked and weeping oil at five locations, including a crack on one of the wear plates themselves; bulging was also noted at the bottom of the wear plates. These were recommended to be ground out and repaired on TAW-7171; instead, EWO # BE 301-E11 was written to install a series of 10 angle clips to prevent the wear plates from falling if the welds completely failed. Recommend replacing the wear plates and reorienting them horizontally as in C-1160 next shutdown.
B) Unlined Surfaces
Top Head to Tray 46 (KG): Much of the top head was covered by a very thick scale. The scale was soft and easily scraped off for inspection of the head. Very little corrosion was noted throughout this area. Some minor pitting to as deep as 20 mils is seen but has been noted in past histories. At the time of inspection trays 47 & 48 had been completely removed and had not been re-installed. These trays exhibited heavy corrosion.
Tray 45 - 35 (SE/CH/DD/RN): Internal inspection reveals residual product build-up on the shell, top and bottom heads. Residual product scale 12-15 mils thick noted on trays starting from tray 48 to 35. Areas physically cleaned and visually inspected at each tray with light measurable corrosion .010" with a few pits to 0.02". No distortion, bulging, or notable corrosion was found. The shell from trays 48 through 35 has scattered loose soft blistering scale measuring ~3/16" thick but no significant corrosion was noted (~0.01).
Trays 34 - 19 (DD/RN): Same as Tray 45 - 35; a dark grayish scale with occasional rust flashes from liquid accumulation during shutdown. See "Trays/Pans" below for details on internals. Only minor pitting noted as above. The clad / non-clad interface exists below the collector tray above Tray 18 and is visible inside the sumps for the collector tray. Access was difficult for UT (see NDE notes below).
Trays 18 to Bottom Head (KG/JG/RD): The 410SS liner exhibited no defects other than occasional mechanical dings and minor dark-colored scale. No notable pitting or any corrosion present.
C) Weld Seams (KG/RD/CH/DD/RN/RK): Weld seams were found full-profile with no appreciable erosion or corrosion.
D) Nozzles (KG/RD/CH/DD/RN/RK): Nozzles were found free and clear of excessive fouling; sludge build up was noted on 10" draw (N4) and in some others, this was cleared out prior to closure. Some had residual liquid in them following blinding. Nozzles N-44 and N-45 were inspected to ensure no corrosion was occurring between the cladding and the exposed shell (they had been installed flush with the shell OD about 1991 and the carbon steel shell edges exposed by the holes was not protected by overlay or lining following installation). Minor pitting to ~0.01" was noted on some of the manway barrels. Nozzles N1A/B (overhead outlet) were visually inspected, only minor ID and internal OD corrosion was noted; this was a concern since major portions of the overhead line were being replaced with Hastelloy C-276 lined carbon steel piping due to internal corrosion. The top vent (N21) was covered with scale but no corrosion was found by UT.
E) Gasket Surfaces (KG/RD/CH/DD/RN/RK): Only minor mechanical damage less than 0.01" was noted and no repairs were required on any of the manway nozzle gasket surfaces.

Internals
A) Demister Pad: N/A
B) Trays / Pans
Trays 48 through 35 (RD/SE/CH/KG/DD/RN): The 8" reflux distribution header is covered with thick scale (~1/4") but the distribution holes appear to be clear. Sections of trays 48 and 47 have begun to corrode to failure and should be replaced to ensure a five year run. Note 2002 inspection notes indicate that tray 48 was replaced. (These two trays were replaced this shutdown; # 48 with Monel, # 47 with CS - jmg) Also the center downcomer panel for tray 46 has holed through and should also be replaced. Trays 35 - 37 were replaced in-kind (except for larger downcomer areas) per EWO # 1627 (planned work).
Trays 34 through 10 (DD/RN): Trays had a light, flaky grayish scale/residue that partially plugged the holes (especially on tray 25), this fouling tendancy decreased the further one went down the column. The downcomers walls and vertical internals were clean; the collector tray (#19) had ~ 1/2 barrel of sludge in the troughs. Trays 30 - 26

were replaced in-kind per EWO # 1555 (planned work).
Trays 9 to 1 (KG/JG): The trays were completely removed in order to install new stripper trays and truss supports (trays 1 - 5); trays 9 - 6 were reinstalled after cleaning.
C) Downcomers: See above information on trays. The downcomer seal pan for tray # 26 had two holes about ~18" from either end; a plate was installed over the existing bottom and screwed in place (see EWO # BE301-E12). Some of the downcomers had sludge/scale in them; they were cleaned out prior to final closure.
D) Packing: N/A
E) Internal Piping: ATCR internal distributor piping was found corroded and plugged at the top of the column; the piping and the matching mating flange on the internal portion of the nozzle were replaced in-kind. The stripping steam spargers were replaced per EWO # 1542 (planned work). The 6" meter pipe and the two 9" overflow pipes from the bottom of tray 6 to the collector tray were found bent and mechanically damaged and were repaired per EWO # BE301-E13 R1. The distributor piping on trays 37, 21, & 9 were found unfit for continued service and were replaced per EWO # BE301-E7 R1.
F) Baffles / Wiers: See tray comments above; minor plugging and scale build-up was removed prior to closure.
G) Vortex Breakers: Intact and cleaned out prior to final closure.

NDE:
A) Type / Extent: UT performed at all available TMLs.
B) Results: The shell at tray # 31 had a reading of 0.69" giving a 13.9 MPY corrosion rate and a 9.14 year remaining life when compared to the 0.76" reading taken on 2/02; next inspection date is 9/2011 (near the next scheduled shutdown date) and the retirement date is 4/2016. Nozzle N3 has a 20.7 MPY rate and a 22.3 year remaining life from the 2/02 gagings (1/2-life is 2/2012 & the retirement date is 5/2024); readings were not obtained this shutdown to confirm.

Cleaning:
A) Method: Internals were manually cleaned as required by PED.

IWO #s/EWO #s: (see above inspection notes)

Future work:
Monitor the shell at the clad/non-clad interface as available OTR or during the next shutdown. Inspect/UT gage nozzle N3, the shell at tray 31, and the shell at the new stripping steam spargers to confirm corrosion rates.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Classification:

Method of Detection:

What Happened when it Failed? Tray performance was compromised

Equipment Unavailable:	Yes -
Unit Shutdown:	No -
Process Disruption:	No -
Safety Compromised:	No -
Environmental Impact:	No -
Impact Assoc. Processes:	No -
What was the direct cause?	HCl/Chloride/Chloride Salt
How did it fail?	Leak
Why did it fail?	Maintenance Error
Why did it fail description:	
What is the failure type?	Equipment
What was done to the asset?	Replace
Failure analysis date:	
failure Cost ($):	

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	2/14/2006	**Date Available:**	02/14/2006
History Brief Date:	02/15/2006	**History Brief ID:**	VI-0602146360
Event Type:	Information	**In- Service Date:**	02/14/2006
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	02/15/2006
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	I.R.survey looking at injection point and trans line		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Temperature	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	PEKO
Save:		**Inspected By:**	PEKO

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

trans line has exterior scale, some thermal images show areas of interest

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	9/20/2005	**Date Available:**	09/20/2005
History Brief Date:	09/21/2005	**History Brief ID:**	VI-0509133592
Event Type:	Inspection	**In- Service Date:**	09/20/2005
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	09/20/2005
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Temps/UTs Between # 3 & # 4 S/C By RAT, Temps >550 F Above # 3 s/c, UTs OK		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron Reliability
Cause Category:	Operations	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:	No	**Name:**	JMJG
Save:		**Inspected By:**	JMJG

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

A single vertical row of 18 cookies was cut from just above the # 4 S/C draw nozzle (N12) to the level of the # 3 S/C draw nozzle (N9) and four additional cookies were cut above the # 3 S/C draw nozzle to determine if the metal temperatures are above the threshold limit for sulfidation corrosion (limit is 550 deg F) and to obtain spot UT gagings for the same.

Temperatures ranged from 648F just above the # 4 S/C draw nozzle to 547F above the # 3 S/C draw nozzle. There were some significant variations within the sampling points (actual range was 648F to 514F about 1/2-way between the two nozzles). These are above or right at the sulfidation corrosion limit.

UT gagings taken varied from 1.10" just above the # 4 S/C draw nozzle to 0.89" above the # 3 S/C draw nozzle. These were slightly higher than the last recorded gagings (2/02) which ranged from 1.02" to 0.84" in the same general area. It should be noted that only a very small percentage of the total area subjected to sulfidation corrosion was inspected.

The locations of the cookies are well-known and further inspections will take place both prior to and during the 10/06 shutdown.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	9/15/2005	**Date Available:**	
History Brief Date:	09/15/2005	**History Brief ID:**	EI-0509133094
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	09/15/2005
Asset Type:	251	**Inspection Type:**	EVI
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Temp Betweem #4 & #3 S/C >550 degF, Reco'd To Cut Cookies/UT/IR Gun		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron - General
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	General
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	

Reliability Comments:

It has been determined that the temperature of C-1100's shell is greater than 550 degF above the stopping point of the 410SS cladding at the tray 18 sidecut draw tray (# 4 S/C). In order to determine exactly where the temperature drops below 550 degF, it will be necessary to cut cookies, use a temperature measurement device, and UT gage between # 3 and # 4 S/C draw-offs. A reco was written (REC-46973) in order to have the work completed.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	3/28/2005	**Date Available:**	03/28/2005
History Brief Date:	03/29/2005	**History Brief ID:**	VI-0503122961
Event Type:	Information	**In- Service Date:**	03/28/2005
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	03/29/2005
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	I.R. scan of transfer line below injection point		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Temperature	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	PEKO
Save:		**Inspected By:**	PEKO

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

I.R. scan / heavy scale on exterior of line causes I.R. images to look poor.. Scale should be removed

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	1/6/2005	**Date Available:**	
History Brief Date:	01/11/2005	**History Brief ID:**	EI-0501118219
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	01/06/2005
Asset Type:	251	**Inspection Type:**	EVI
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	5 Year External VT/CUI Insp, Reco'd For Decking/CUI Issues		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron - General
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	General
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	

Reliability Comments:

A 5 year visual and CUI inspection was performed on C-1100. The following was noted:
Top deck: N21 (top bleeder) insulation needs sealing; ladder/cage/railings have external corrosion.

2nd deck (south): No issues.

3rd deck (south to southwest): Seal M-1 and N2; remove insulation from N2 (runs about 100 deg F metal temperature).

4th deck (west): Strip / inspect / reinsulate 2 areas: one above 1st vacuum ring running south to west (about 1' high by 15' long); the other above the second vacuum ring (1' H x ~18' long in two locations). Seal N1A/N1B.

5th deck (southwest): Seal N3, N4, PDT-001. Seal 2 holes in insulation cover (west & southesast).

6th deck (south): Seal N5A/B, N6A/B, M-2.

7th deck (southeast): Minor damage noted on insulation cover between column and deck sill.

8th deck (southwest): Seal PDT-002, N7; patch ~ 1' sq area at PDT-002.

9th deck (south): Seal N8; Deck plate section at ladder has corroded through, needs replacement.

10th deck (northeast): Seal N9.

11th deck (south): Seal N10 and repair damaged insulation above vacuum ring below N10; repair gap between C-1110 top deck and deck 11.

12th deck (northeast): Seal N11A/b & patch ~6" sq area above broken ladder to deck 16; broken access ladder to deck 16 previously recommended for repair.

13th deck (south): Seal M-3 & patch 10" sq area below M-3; patch around supports for deck 11.

14th deck (southwest): Seal N12 & two PDT-003 nozzles; patch 3 areas: ~ 2' sq at N12 & (2) ~10" sq areas at PDT-003 nozzles.

15th deck (southeast): No issues.

16th deck (northeast): Seal N44 & N45; seal 2 gouges in insulation cover (~ 2' long) on east side of column.

17th deck (south): Seal N13; patch ~ 1' sq at PDT-004 nozzle; patch small holes @ N13.

18th deck (north): Seal M-4; patch 10" sq area above & 10' to right of M-4.

19th deck (northeast): Seal N41 & N42 (LT-051 nozzles).

20th deck (south): Seal N14 & N15; patch (2) 8" sq areas: one above & to the right of N14, one at N40 (TI nozzle); seal small holes near N40.

21st deck (northeast to north): Seal & patch (8) TI/PT nozzles (~ 2-3 sq ft).

22nd deck (south to west): Seal N17 & N35A/B; patching required around N35A/B (~6 sq in). Repair corroded deck plate on southwest edge of deck.

23rd deck (south to east): Seal M-5 & ~10 - 15 small gouges in insulation cover (~ 1" - 2" in diameter). Remove 3 sharp tears/gouges in deck plate near ladder (tripping hazard).

24th deck (west): Reinsulate and seal 8" steam inlets (N19 A/B); patch ~ 1' sq @ N18.

25th deck (southeast): Seal LT nozzles N22A & N24.

26th deck (south, also 1st deck up from grade level): Seal & patch ~ 2' sq around LT nozzles N22B and N23; clean up oil spill (safety hazard).

The above was put on an OTR recommendation for repair on 1/11/05. -jmg

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	10/11/2004	**Date Available:**	10/11/2004
History Brief Date:	10/11/2004	**History Brief ID:**	VI-0410113525
Event Type:	Information	**In- Service Date:**	10/11/2004
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	10/11/2004
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Injection point I.R. scan		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Temperature	**Maintainable Item:**	Lining/Cladding
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	PEKO
Save:		**Inspected By:**	PEKO

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

I.R. scan of injection point looking for area's cooler thinking it's corrosion acting as insulation

History Brief Date:	10/12/2004	**History Brief ID:**	VI-0410113593
Event Type:	Information	**In- Service Date:**	10/11/2004
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	10/12/2004
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	revisit of report at request of inspector		

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Temperature	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	PEKO
Save:		**Inspected By:**	PEKO

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

answering questions about first report found background temp wrong on image causing difference in temperature seen in different images

History Brief Date:	10/12/2004	**History Brief ID:**	VI-0410113605
Event Type:	Inspection	**In- Service Date:**	10/11/2004
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	10/11/2004
Asset Type:	251	**Inspection Type:**	EVI
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	CUI Found 200' Elev On H2O Inj Nozzle Platform, Reco'd For Insul Rmvl/Rpr		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	JMJG

Findings:

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

PCA ID:
Inspectable:
Sub Item:
Part:
Discussion:

Condition:
Action:
Location:
Damage Mechanism:
PCA Work Order No :

Reliability Comments:

An area of damaged insulation ~3' high by ~15' long was noted on the west side of C-1100 just above the 2nd insulation ring down from the top. The area is accessible from the overhead line water injection nozzle access platform. An area of the shell was checked for CUI, scaling and CUI to ~ 1/4" thick was found. UT gaging of a representative area was 0.66" (originally 0.68"). An inspection recommendation to remove the insulation, check for CUI, repair as required, and reinsulate/seal the area will be sent via the new IR work request system. The area temperature was approximately 250 plus deg F.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	10/7/2004	**Date Available:**	
History Brief Date:	10/07/2004	**History Brief ID:**	EI-0410113391
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	10/07/2004
Asset Type:	251	**Inspection Type:**	EVI
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Four Of Six Ladder Clips To Colum Lose, 2nd to 3rd Platforms Down @ North Side		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron - General
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	General
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	

Reliability Comments:

Four of the six retaining clips fastening the ladder from the 2nd to the 3rd deck down on the north side of the column have broken loose and require repair. A recommendation ( ) was written for repair.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	9/29/2004	**Date Available:**	09/29/2004
History Brief Date:	09/29/2004	**History Brief ID:**	VI-0409112886
Event Type:	Information	**In- Service Date:**	09/29/2004
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	09/29/2004
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	I.R. scan of injection area		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Corrosion	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	PEKO
Save:		**Inspected By:**	PEKO

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

J.George requested injection point I.R. scan this was done last in January

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	6/16/2004	**Date Available:**	06/16/2004
History Brief Date:	06/17/2004	**History Brief ID:**	VI-0406106245
Event Type:	Information	**In- Service Date:**	06/16/2004
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	06/16/2004
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	ATCR Return Area Flooding Per Gamma Scan, Losing # 4 S/C		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Operations
Cause Category:	Operations	**Program Status:**	
Effect Category:	Performance	**Maintainable Item:**	Internals
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	JMJG

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

The 6/17/04 RSC report notes the following results for the gamma scan conducted on 6/15/04:

"Preliminary gamma scan results indicate flooding in the ATCR section of C1100. The loading and dumping of this section of the column could be part of the cause for loss of 4 S/C. To address this we are raising column pressure. We will be holding feed stable at 245 MBPD while we test for the next few days. We will not be doing mudwashes until stable operation has been confirmed on C1100. The scan indicates the trays in stripping section of C1100 are no longer holding a liquid level. This data is consistent with high slop oil rate off C1160 which has been observed since the startup. (See PE notes for follow up steps.)"

Will continue to monitor this for further developments.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	3/30/2004	**Date Available:**	03/30/2004
History Brief Date:	03/31/2004	**History Brief ID:**	VI-0403102265
Event Type:	Information	**In- Service Date:**	03/30/2004
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	03/31/2004
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	I.R. scan of injection area		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Corrosion	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:	No	**Name:**	PEKO
Save:		**Inspected By:**	PEKO

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

I.R. scan to look for cool spots that may indicate corroison

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	1/19/2004	**Date Available:**	01/19/2004
History Brief Date:	01/29/2004	**History Brief ID:**	VI-0401099145
Event Type:	Information	**In- Service Date:**	01/19/2004
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	01/29/2004
Asset Type:	251	**Inspection Type:**	EVI
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	I.R.scan of injection area		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Reliability
Cause Category:	Information	**Program Status:**	
Effect Category:	Temperature	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:	No	**Name:**	PEKO
Save:		**Inspected By:**	PEKO

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

I.R. scan of injection point area for cool spots that may indicate corrosion

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	8/7/2002	**Date Available:**	
History Brief Date:	08/19/2002	**History Brief ID:**	HB-0208077999
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	C-1100 Gamma Scanned, No Hardware Issues Noted, PED Analyzing		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron - General
Cause Category:	Operations	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Internals
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	1/19/2002	**Date Available:**	
History Brief Date:	02/25/2002	**History Brief ID:**	HB-0202068842
Event Type:	Repair	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	S/D- Int Insp, Upgraded 9 Trays To 410SS, Tray 48 Rpl Due To NH4Cl Corr		

Reliability Analysis:

Event Type:	Repair	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Internals
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:	No	**Name:**	JMJG
Save:	Yes	**Inspected By:**	

Findings:

PCA ID:	PCA-002018412	**Condition:**	
Inspectable:	GENERAL	**Action:**	Replaced "In-kind"
Sub Item:		**Location:**	
Part:	INTERNALS	**Damage Mechanism:**	9
Discussion:		**PCA Work Order No :**	

Reliability Comments:

2/25/02 3:52:20 PM
Entered By Terry Gayer

SUMMARY (HISTORY BRIEF)
Internal Inspection during the 1Q2002 Shutdown

DIRTY INSPECTION:
The internal inspection was performed while the vessel was in a dirty condition, particularly tray 18 and above. This limited the quality of the inspection as only random areas cleaned with a hand scraper could be closely inspected.

1. EXTERNAL:
A-Insulation/Coating: An external visual inspection of C-1100 access structure (ladders & decking) was performed during the January 2002 unit shut down. The following items were found. Note: A separate list (IWO) was generated to address items requiring attention.
Inspection Summary: The access structure inspection revealed a general coating failure over the entire structure with localized areas of moderate to heavy corrosion. The non-skid coating found to be approximately 50% failed.1/2 to 1

gallon of scale and debris was noted on nearly all decks.
Specific's
Ladder # 1. No mechanical damage or distortions noted. The bolting, clips and safety bars were tight, intact and functional.
Platform # 1. The deck plates were distorted and holding water in several areas. No mechanical damage, loose bolting noted.
Ladder # 2. No mechanical damage or distortions noted. The bolting, clips and safety bars were tight intact and functional.
Platform # 2. The deck plates displayed minor distortion with standing water. No mechanical damage noted.
Platform # 3. (east side) Displayed minor distortion due to contact corrosion at the stitch welded seam. Distortion is approximately ?" to ?" above flush. (west side) Displayed no mechanical damage or distortions. The bolting and toe plates, handrails were tight and intact.
Ladder # 3. The bottom 2 bolts are broken. No other mechanical damage noted. The remaining bolts and clips are tight and intact.
Platform # 4. The deck plates, handrails and bolting are all tight and intact. No mechanical damage or distortions were noted.
Platform # 5. The toe plates east of the crossover to C-1130 displayed insignificant mechanical damage. No other distortions or damage noted.
Platform # 6. No mechanical damage or distortions noted. The bolting and handrails were tight and intact.
Platform # 6.5 and ladder. The deck. Ladder , safety rail, handrail and bolting were tight and intact.
Platform # 4 A/B. The rungs, clips, bolting and safety rails were all intact, tight and functional.
Platform# 7.7.5,8,9,and 10. These decks displayed no mechanical damage or distortions. The decks,handrails and bolting were tight and intact.
Platform # 11. In good mechanical condition. Slight buckling of deck plate noted. General coating failure with minor to moderate corrosion noted over all components
Ladder. Several cage attachment welds have corroded loose. General coating failure with minor to moderate corrosion over all components.
Platform #12. General coating failure with minor active corrosion. Isolated moderate to heavy corrosion along toe board. In good mechanical condition.
Ladder- Located moderate to heavy corrosion on cage stringers.
Platform # 13. General coating failure with localized moderate to heavy corrosion along deck to support contact points.
Ladder from deck 13 to 14 localized moderate to heavy corrosion on cage components. Several attachment welds have corroded loose.
Platform # 14. General coating failure with minor active corrosion.
Ladder from 14 to 15 General coating failure with minor active corrosion. Localized moderate to heavy at cage stringer attachment welds. Stringer is loose.
Platform #15. General coating failure with minor to moderate corrosion.
Ladder from 15 to 16. General coating failure with minor active corrosion. Localized moderate to heavy corrosion of cage fasteners.
Platform # 16 General coating failure with minor to moderate corrosion. 1st, 2nd, & 3rd plates are offset due to buckled plates causing possible tripping hazard.
Ladder from 16 to 17 General coating failure with minor active corrosion.
Platform # 17. General coating failure with minor active corrosion.
Ladder 17 to 18 Coating failure with minor active corrosion.
Half deck- Coating failure with minor active corrosion. Standing water noted around pipe penetrations.
Platform # 18. Coating failure with minor to moderate active corrosion.
Ladder 18 to 19- Coating failure with minor to moderate active corrosion.
Platform # 19. Coating failure with minor active corrosion.
Ladder 19to 20 - Coating failure with minor active corrosion.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Platform # 20. Coating failure with minor to moderate corrosion around bolting/ plate steel contact points.

In general the insulation & weather cover is in serviceable condition with several areas that need repair see the following areas.
1. 5 sq ft of missing /loose weather cover below nozzle N1A & N1B.
2. 2 sq ft loose weather cover at tray 34 pressure gage nozzle.
3. 2 sq ft missing weather cover south side about tray 22 area.
4. 10 ft missing cover on support ring and loose banding near nozzle N10.
5. Weather cover around N11 nozzle.
6. Loose weather cover around 3" nozzle near N12.
7. 2sq ft missing weather cover around N12.
8. 2sq ft missing weather near M4 manway.
9. 2sq ft missing weather cover around N42
10. 5sq ft missing weather cover near N14 & N15.
11. 4sq ft missing weather cover and loose band at N38 & N39.
12. Loose band at M5 manway.
13. 5sq ft missing weather cover at N17 nozzle.
14. 2sq ft missing weather cover at N28-N29.

B-Ladders/Platform:
Ladders/platforms in generally satisfactory condition except the loose risers on the ladder cage at the top deck and a heavy corroded deck plate at N17 nozzle.
C-Ground Wire:
Ground wire in satisfactory condition.
D-Skirt/Fireproofing:
Skirt and fireproofing in satisfactory condition with only minor cracking of the fireproofing.
E-Foundation/Supports:
General spalling off of the concrete around the foundation and anchor bolts.
F-Anchor Bolts:
General spalling off of the concrete around the foundation and anchor bolts.
G-Name/Data Plates:
Name plate & EQID tag in tact and readable.

RECOMMENDATION:
1. Repair insulation/weather cover as noted above.
2. Repair the cracked & broken welds on the ladder cage risers at the top level.
3. Replace the corroded deck plate at the level where N-17 nozzle is located

2. SHELL & HEADS:
A-Strp Lng/W'Olay/Coat'g :
The 410 SS from tray 18 to the bottom head was in good condition with no visible sign of damage and exhibited virtually no corrosion. The exception was trays 1-3 and 5 which had undercut(installation welding defects) at the downcomer vertical stay support stitch welds. These areas were copper sulfate tested and did not penetrate the cladding.
B-Unlined Surfaces:
Tray 48-32 The shell exhibited approximately 0.20 to 0.375" loose black product scale. Scraped areas of the top head and shell show no corrosion greater than 0.01" deep.

Tray 32-18 The product scale steadily lessened until it was much cleaner at tray 18. The shell showed no corrosion greater than 0.01".
Tray 18 to bottom - See lined surfaces.
C-Weld Seams:
All visible weld seams were free of visible defects and the weld caps surfaces were comparable to the shell.
D-Nozzles:
The accessible nozzles were clear debris and comparable to the shell, The pump around nozzles at the tray 16 were found to be in good condition with no corrosion of the exposed carbon steel shell. These two 6" nozzles were hot tapped through the shell and cladding some time in the '80s and the exposed carbon shell was not overlayed with stainless. This area was check by engineering in 1995 and was in good condition. A follow up check was recommended for this shutdown. No issues other than these two nozzles are not shown on the UT drawings.
E-Gasket Surfaces:
Gasket surfaces need cleaning.

3. INTERNALS:
Following PED investigation into the overhead line corrosion discovered this S/D a memo was issued regarding the temperature differential between C-1100 overhead temperature and the ammonia chloride sublimation point. (NH4Cl sub pt.)
Per the memo , a 25 F differential needs to be kept at all times to prevent the NH4Cl from forming and causing underdeposit corrosion. (Best Practice)
For an eleven month period prior to the 11/00 S/D the overhead temp was higher than usual, leading to a lower temp differential (AT) & causing NH4Cl to form. Cleaning the desalter (V-1102) during the 11/00 S/D improved its performance, lowering chloride levels & (raising) the AT.
It is believed that the NH4Cl that formed caused tray 48 in C-1100 to corrode, leading to its replacement and may also have contributed to the overhead line corrosion. PED will more frequently monitor the NH4Cl AT & will develop process guidelines to avoid this condition, monitoring will involve both online and nalco data obtained from the field. (AT= delta T = Temp. differential)
A-Demister Pad:
None
B-Trays/Pans:
Tray-48 Heavily corroded. Approx. 1/4" of loose black product scale on tray, hardware and shell.
Approximately 2 sq ft of tray corroded through. Original 0.60" dia. Holes are now washed out in an elongated manner to 0.09". Tray 48 was replaced.
Tray 47 through 35-1/8" to 3/8"scale. Trays are in much better condition than tray 48. The visible hardware and tray supports were on serviceable condition. Tray 35 had two sections of blown out panel, Tray 35 through 37 were replaced with new 410 SS fixed cap trays per PED, so no action was required.
Collector tray below 35- The chimney covers were found to be damaged. IWO Cta02-33 was written to repair the chimney covers and this work was completed.
Tray 34 had slightly less debris. Tray and hardware were in satisfactory condition.
Tray 33 through 26 were dirty with 1/8" to 1/4" of loose scale and debris. The trays were slightly bowed.
Tray 33 through 31 were replaced with 410 SS fixed cap trays per PED.
Tray 25 through 22 were bulged upwards and displayed thinnung and metal fatigue. The diversion clips were corroded to near failure and were weakened beyond usefulness.
Tray 25 through 22 were replaced with new 410 SS fixed cap trays per PED.
Tray 21 through 19 were clean and smooth with little or no corrosion or mechanical damage. These trays had been scheduled for replacement, however they had been upgraded to 410 SS during a previous shutdown so no additional work was required.
Collector tray nelow 19 had approximately 1' of sludge in the downcomer and had broken chimney tray top braces. IWO Cta02-33 was written to repair the chimney covers and to remove the sludge and this work was completed.

Trays 18 through 10 were clean and smooth with little or no corrosion or mechanical damage.
Collector tray below 10 was in satisfactory condition with exception of sludge. The sludge was removed per PED recommendation.
Tray 9 through 6 were dirtier than the trays above but were found to be smooth with little or no corrosion.
Flash Zone (below tray 6) one of the vapor hats was blown off and the downcomer inside wall was distorted. The attachment welds on the inlet impingement plate were cracked and some welds between the plated were cracked as well. Some of the plates were bulged 3" to 4". An IWO was issued to remove and repair the effected areas of the wear plates, but action was deferred to a future date. IWO CTA02-33 was written repair the vapor hat and downcomer and this work was completed.
Tray 5 through 1 were in satisfactory condition. Enbrittlement was anticipated in this area but none was noted. The trusses and supports were a collection of splices and modifications. Truss repair was also anticipated, but they were found to be functioning effectively so no action was taken at this time.
C-Downcomers:
See tray and pans above.
D-Packing:
None
E-Internal Piping/Distributors:
The reflux inlet (tray 48) was covered with a thick black residue, plugging many holes. Hand scrapping revealed general pitting to 0.06" on the arms and up to 0.11" on the header. The bolting was in place and it was secure.
The top circulating reflux (tray 37) was in place and secure. The piping was dirty, but the wholes were round and open. No significant external corrosion was noted.
The bottom circulating reflux (tray 21) was in satisfactory condition with only minor corrosion to 0.03". No pitting or disruption was noted.
F-Baffles/Weirs:
See tray and pans above.
G-Vortex Breakers:
The vortex Breakers and screen were in place and secure. There was no significant corrosion noted

4. NDE:
A-Type/Extent:
UT survey of the shell , nozzles and trays was performed. All readings well above Tmin. Worst case UT is N3. 1995 UT was 0.92", 2002 UT was 0.79". Corr. Rate is 20.5 mpy. Remaining life is 28.7 years, 14 year 1/2 life (based on 0.13 t-min). Per the last inspection, there was extensive wasll loss expected in tray 4. Extensive UT was taken in this area and all readings were at or above nominal. There is a change in the shell thickness in this area (course 2 to course 3) and this may have led to misleading UT data in the past.
B-Results:
Nozzles A& B on field marked-up drawing were UT gaged. These are the 6" #5 s/c pumparound nozzles above Tray 16. UT gaging ranged .43-.48 for "A" nozzle (north side) & .43 - .46 for the "B" nozzle (east side) . Recommend gaging these nozzles at the next opportunity.

5. CLEANING
A-Method:
B-Surface Prep:

6. MICELLENOUS/ OTHER
INLET LINE - inspected the ID of the atmospheric transfer line to the end of the horizontal 90 down.
Marked up 12 areas where the welded or strip liner repairs hs penetrations. Several strips(3-4) showed bulges that

may have trapped product behind them. Two small nozzles (one wasTW) showed bleed out, but couldn't determine if they were holed through or not. The last liner section down in the vertical section of the run showed 13 to 15 bleed outs, but could not be closely inspected. Several of the indications were areas where the strips were sealed with a single downhill pass if stainless, and they simply missed the edge of the strip. The surfaces of original unrepaired cladding were in serviceable condition. An IWO was written to remove insulation and perform thickness scanning over some of the striplined areas. UT data ranged from 0.35" to 0.44". There was no evidence that significant corrosion had occurred under the striplining. Since the bleed outs were similar to that noted during the previous two s/d's, no repairs were performed at this time. This area should be inspected at the next opportunity.

7. IWO' #

8. HYDRO-TEST:

9. FUTURE WORK:
The Reflux inlet at tray 48 has heavy OD corrosion and may require replacement at the next shutdown. The auto cad drawing is not correct. It is missing the two 6" #5 pump around nozzles at tray 16 and the trays are numbered incorrectly. The collector trays are not counted as trays on the original drawing. The drawing should be corrected to avoid future confusion.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	11/20/2001	**Date Available:**	
History Brief Date:	11/29/2001	**History Brief ID:**	HB-0111065732
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	C-1100 Pre-S/D Ext Insp, Top Ladr Cage Dmg/N17 Deck Corr, Minor Insul Dmg		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron Reliability
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Platforms/Ladders
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	10/23/1995	**Date Available:**	10/23/1995
History Brief Date:	10/23/1995	**History Brief ID:**	RPR-829063
Event Type:	Repair	**In- Service Date:**	10/23/1995
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	INT INSP DURING MAJOR T/A-REPL TRAYS 1-5,38-48.DMM		

Reliability Analysis:

Event Type:	Repair	**Worked Performed By:**	Chevron - General
Cause Category:	Information	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	Shell
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	DANM
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

EXTERNAL Insulation/Coating - The insulation covering was damaged at bottom manway with straps loose at various levels. Ladders/Platforms - The platform 18 deck was holed through in four spots, south side at ladder. (Safety Item.) The ladder cage supports were corroded through at various levels. (Safety Item.) A 2" steam line was jammed up against the cut-out at platform 23 at overhead line "Y". Ground Wire - Ground wire was attached. Skirt/Fireproofing - Vessel skirt showed no significant corrosion. Fireproofing was in place with small tight cracks and no spalling. Found'n/Supports - Foundation was serviceable with no spalling noted. Anchor Bolts - Anchor bolts were not visible. Name/Data Plates - Name plates were secure and visible. SHELL & HEADS The column was opened to permit 10-year inspection and necessary repairs to damaged internals. Internally the column was very clean which indicates the potassium promaginate wash worked very well except it created quite a lot of sludge downstream in V-1160 and the C-1190 Stabilizer OH system. Visual inspection and ultrasonic inspection found the column to be in overall good condition with no significant corrosion found. The top head was not staged but little or no corrosion could be seen from the top tray. The upper shell and top head was covered with a light solf scale approximately 0.10" thick. The shell between trays 36-48 had mild general unmeasurable corrosion with scattered pitting to a maximum depth of 0.01". The shell was covered with a soft product type scale ranging from 0.03-0.10" in thickness. The shell between trays 22-35 had no visible corrosion except for some unmeasurable pitting at trays 25-27. The shell above the collector tray (above 18), through 21, had mild general corrosion with scattered pitting to a maximum depth of 0.01". The shell at trays 10-18 had no visible corrosion. The T-410 SS cladding between the bottom head and tray #18 was in satisfactory condition with no evidence of corrosion or disbonding. The transfer line was internally inspected. No

significant corrosion was seen. A few small pin-holes were seen in the striplining, but external UT readings indicated no corrosion underneath. They were also present during the past 88 inspections and repairs were deferred. No repairs were made on the pinholes this T/A. Ultrasonic thickness readings were obtained on the shell (at each tray elevation) and heads. The UT readings indicate no significant corrosion except for the shell at Tray #4. The shell has a corrosion rate of 5-8.6 mpy (depending on whether you use the 85 or 88 inspection data). Worst case, if you use only the 88 inspection data, the shell has a remaining life of 5.3 years. Since visual inspection saw little or no corrosion and more thorough UT gaugings were obtained this T/A, it is likely that the corrosion rate is likely 5 mpy w/ 9 years remaining life to tmin. Inspect this tray area at half life or 5-6 years. INTERNALS C-1100 was opened because of known damage between trays 38-48 which were damaged on a previous plant start-up. Seventy-five percent or more of all the active tray panels between trays 38-48 were found upset, damaged, and laying on tray #37. New carbon steel trays were installed with stiffening bars, heavy duty clamps, and thicker friction washers were installed to withstand a 1 psi uplift. All of the minor and major support beams were severely damaged (blown upward) and were replaced with larger, stronger beams. The main truss beams were in satisfactory condition. Most of the center and side downcomers were reused. Totally new bolting was installed, all of which were heat treated to minimize sulfide cracking in the threads. Trays 47 and 48 were changed from T410 SS to carbon steel to prevent pitting in the wet, sour service. Trays 6-37 were found to be in overall good condition except for some minor mechanical cleaning in the side and center downcomers. The following was noted, but no repairs were made: Tray 34 was bowed up 3 inches; Tray 32 is sagging 2.5 inches; Tray 30 is sagging 3 inches. Several loose tray hold-down clips and bolting was tightened at tray 19 and 20. The chimney tray below tray 10 was missing four supports which required replacement. The collector tray above Tray 5 vapor hat on the west side had blown off and some of the T 410 SS panels were torn and required replacement. The flash zone transfer line impingement plate welds had cracked in several locations. It seems as if when it was originally welded together, there was no joint seam preparation. The plates were butted together and welded. The welds were ground flush leaving virtually no weld metal to hold the plates together. Once the main seam broke open, several other attachment welds away from the nozzle also broke. All were welded back together, well in excess of 20 linear feet. No damage was noted to the cladding. The overflow well was arc damaged during tray repairs and required rewelding. Trays 1-5 were in poor condition basically from operational upsets. These trays were very uneven and did not hold proper liquid levels. It was first decided to replace only the active tray panels, but once the panels were removed, it was noted that the main trusses were severely bent upwards. Initial straightening attempts sheared a tray clip from Tray #3 truss attachment. Since T 410 SS truss material was not readily available, it was decided to repair what we had. The truss support angle iron was cut and scab patched. The repair was considered very poor quality, but it was the best they could do in the available time frame. The repair significantly weakened the supports for these trays. Also, these trays have 885 imbrittlement which reduces their structural integrity. New trusses should be ordered for trays 1-5. The vortex breaker was in satisfactory condition except for some fouling. The breaker was cleaned before closing the column. CLEANING / SURFACE PREP METH The ultrasonic thickness readings taken indicate a nonsignificant metal loss except as noted in section 2. The final penetrant examination performed on the overflow thermowell repair was satisfactory. The penetrant and copper sulphate inspection for the side wall clip at tray 3 was satisfactory. The vessel was potassium promaginate, steamed, and water washed with additional hard cleaning needed at work locations. MISC./OTHER The strip lining in the transfer line was weeping oil in several locations. This condition was noted in previous inspections and was considered not significant. Request for repairs was deferred. REPAIR IWO/EWO Numbers EWO #E301-E3 was issued to repair trays 1 to 5. Severe 880 inbrittlement interferred with straightening the strusses with the final condition of the finish trays having a 1-1/2" ..... between supports. Repairs were made to trays #6 and #7 by replacing loose bolting and tray panels; also reinstalling missing chimney hat supports. FUTURE WORK Have new supports on hand for trays 1 through 5 and collector tray.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	1/31/1993	**Date Available:**	01/31/1993
History Brief Date:	01/31/1993	**History Brief ID:**	RPR-829064
Event Type:	Information	**In- Service Date:**	01/31/1993
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	PLANT S/D, P 1102'S WOULDN'T START		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron - General
Cause Category:	Information	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	Internals
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

The 4 Crude Unit s/d unexpectedly shortly after union/managment contract talks stopped, (The day before the contract expired). The P 1102's some how shutdown and the APS system circuit breaker was tripped. It took nearly 4 hours to locate the tripped circuit breaker. The unit returned to normal feed rates 3+ days after the S/D.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	11/26/1992	**Date Available:**	11/26/1992
History Brief Date:	11/26/1992	**History Brief ID:**	RPR-829065
Event Type:	Repair	**In- Service Date:**	11/26/1992
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	GAMMA SCAN, TOP 7 TRAYS DAMAGED DURING S/U		DMM`

Reliability Analysis:

Event Type:	Repair	**Worked Performed By:**	Chevron - General
Cause Category:	Operations	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	Internals
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	DANM
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

During start-up after the power loss S/D, the top 7 trats were damaged & are not holding proper liquid levels. Now, all the 1 S/C is pulled from the 2 S/C draw. The upper part of the column is now ran flooded to pull all the jet from the 2 S/C nzl. A test run was performed in Dec. to det-ermine if an unsch S/D would be req'd to repair the trays. Not sure if the unit can produce on-test product during max mogas season.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	11/11/1992	**Date Available:**	11/11/1992
History Brief Date:	11/11/1992	**History Brief ID:**	RPR-829066
Event Type:	Information	**In- Service Date:**	11/11/1992
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	ELECTRICAL FAILURE, 5 DAY PLANT S/D		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron - General
Cause Category:	Information	**Program Status:**	
Effect Category:	Mechanical Damage	**Maintainable Item:**	Shell
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

While working outside the plant, Contra Costa Electric Co. shorted out the electrical feed system to 4 Crude unit. The unit required a completeshutdown. After the electrical problem was fixed, it took 6 days to get the unit back on line. The delays were attributed to at least 20 equip leaks which required repairs. Each equip leak has its own history brief.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	5/11/1992	**Date Available:**	05/11/1992
History Brief Date:	05/11/1992	**History Brief ID:**	RPR-829067
Event Type:	Information	**In- Service Date:**	05/11/1992
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	GAMMA SCAN IND POSS COLL TRAY DMG ATCR SECT DMM		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron - General
Cause Category:	Information	**Program Status:**	
Effect Category:	Mechanical Damage	**Maintainable Item:**	Internals
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	DANM
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

C-1100 was gamma scanned after several upsets in the 2 S/C area of the column. Internal damage in the ATCR section, (below tray #35), may be present. See PED memo dated 5/8/92 for additional info.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	3/26/1992	**Date Available:**	03/26/1992
History Brief Date:	03/26/1992	**History Brief ID:**	RPR-829068
Event Type:	Information	**In- Service Date:**	03/26/1992
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	FD TK SWITCH, UPSET UNIT FEED RATES,5 DAYS DMM		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron - General
Cause Category:	Information	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	Shell
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	DANM
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

C-1100 over pressured due to light product during a feed tank switch. The unit was upset, resulting in lowering rates to 180M Bbl/day for 5 consecutive days. The unit had a LPO of $600,000 based on a $2 profit per barrel of crude.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	2/1/1992	**Date Available:**	02/01/1992
History Brief Date:	02/01/1992	**History Brief ID:**	RPR-829069
Event Type:	Repair	**In- Service Date:**	02/01/1992
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	GAMMA SCAN,POSSIBLE DAMAGE TRAYS 6,7,10 & 11 DMM		

Reliability Analysis:

Event Type:	Repair	**Worked Performed By:**	Chevron - General
Cause Category:	Design	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	Internals
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	DANM
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

The column was gamma scanned. Trays 6,7,10 & 11 may have some minor damage to the sieve trays as they are not holding normal levels. No other problems found. Inspection cost $4000.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	1/16/1992	**Date Available:**	01/16/1992
History Brief Date:	01/16/1992	**History Brief ID:**	RPR-829070
Event Type:	Information	**In- Service Date:**	01/16/1992
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	CRUDE FD TK SLUGGED UNIT W/ WATER DMM		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron - General
Cause Category:	Information	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	Internals
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	DANM
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

The opportunity crude feed tank, (Arab Med), slugged the unit w/ water. Feed rates were reduced for 1 day to $200M bbl avg. There were no known equipment problems associated w/ the upset.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	6/5/1991	**Date Available:**	
History Brief Date:	06/05/1991	**History Brief ID:**	HB-0207076434
Event Type:	Repair	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	EXTERNAL / REPAIR		

Reliability Analysis:

Event Type:	Repair	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Internals
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	DANM
Save:		**Inspected By:**	

Findings:

PCA ID:	PCA-002023621	**Condition:**	
Inspectable:	GENERAL	**Action:**	Deferred
Sub Item:		**Location:**	
Part:	INTERNALS	**Damage Mechanism:**	
Discussion:		**PCA Work Order No :**	

Reliability Comments:

C-1100 Atmospherec Column was Gamma scanned by PED. All trays were found intact and holding liquid. The only qustionable area was between trays 3 and 4 in the stripping section. Tray 3 showed absortion in the vapor space. Absortion is likely caused by tray distress or damage, possible from upset or leaking bubble caps. PED initially recommended an internal inspection of the stripping sectionof the column. Operations, Maintenance, and the Major Projects group determined that an internal inspection in this column would only be made if "More significant reasons arise", otherwide this work will be deferredto the next S/D in 10/94.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	8/29/1990	**Date Available:**	08/29/1990
History Brief Date:	08/29/1990	**History Brief ID:**	RPR-829071
Event Type:	Information	**In- Service Date:**	08/29/1990
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	INFRARED IN FEED RATES FROM 180 TO 195M BBLS/DAY		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron - General
Cause Category:	Information	**Program Status:**	
Effect Category:	Corrosion	**Maintainable Item:**	Shell
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

4 Crude unit feed has been increased from 180m bbls/day to 195m bbls/day in an attempt to produce maximum jet, diesel, and gasoline production. While raising rates pic-1151 malfunctioned causing a minor upset. The unit is presently limited by p-11-1 feed pumps and the desalter pic 1151.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	12/15/1988	**Date Available:**	
History Brief Date:	12/15/1988	**History Brief ID:**	HB-0207076433
Event Type:	Information	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	level control alarm apparently malfunctioned		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Internals
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	DANM
Save:		**Inspected By:**	

Findings:

PCA ID:	PCA-002023620	**Condition:**	
Inspectable:	GENERAL	**Action:**	Deferred
Sub Item:		**Location:**	
Part:	INTERNALS	**Damage Mechanism:**	
Discussion:		**PCA Work Order No :**	

Reliability Comments:

During 3 shift, V-1103 "flash drum" level control alarm apparently mal- functioned allowing 300 degree feed to go out the top of the vessel and into the C-1100 atmospheric column flash zone. Feed rates were lowered to 14 MBPD until the unit was under control. The following day, T. Musial (PED), and CRC performed a radioactive back- scatter test on C-1160 vacuum column. The results indicate the trays werein tact and there was no affect on the vacuum columnn. However, per our conversation with D. Cocke (Materials Engineer), there may be some warpage, distortion, and/or upset trays in the flash zone area due to material expansion and contraction during the stock cooling process. (300 degree feed stock was entered into the 700 degree flash zone.) There is no problem with corrosion or material cracking. Inspection requested T. Musial to look into the process of C-1100 to verify if there is any evidence of damage. At the time of this write-up, no feedback had been obtained.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	10/3/1988	**Date Available:**	
History Brief Date:	10/03/1988	**History Brief ID:**	HB-0207076432
Event Type:	Repair	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	INTERNAL / EXTERNAL / SHUTDOWN / INSP. DUE		

Reliability Analysis:

Event Type:	Repair	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Internals
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	SSSR
Save:		**Inspected By:**	

Findings:

PCA ID:	PCA-002023619	**Condition:**	
Inspectable:	GENERAL	**Action:**	Repaired
Sub Item:		**Location:**	
Part:	INTERNALS	**Damage Mechanism:**	
Discussion:		**PCA Work Order No :**	

Reliability Comments:

THE COLUMN WAS OPENED AT ALL EXTERNAL AND INTERNAL MANWAYS. INSPECTION OF THE COLUMN SHOWED IT TO BE IN GOOD CONDITION WITH THE EXCEPTION OF TRAYS 35 AND 42 WHICH HAD SECTIONS BLOWN OUT OF POSITION DURING THE PLANT RUN. BOTH TRAYS HAD TRAY SECTIONS LIFTED OFF THEIR SUPPORT BEAMS WHICH WOULD HAVE PREVENTED THE TRAYS FROM HOLDING A LIQUID LEVEL. THE TRAY SECTIONS AND THEIR SUPPORT BEAMS WERE BENT AND REQUIRED STRAIGHTENING IN THE COLUMN AND REPOSITIONING. THE REMAINDER OF THE REPAIRS IN THE COLUMN WERE OF A MINOR NATURE WHICH INCLUDED NUTS AND BOLTS, TRAY CLIPS AND CLEANING. THE COLUMN OVERALL WAS FOUND IN A FAIRLYCLEAN CONDITION WITH ONLY MINOR CLEANING REQ. THE TOP TRAYS 48 THROUGH 36 REQUIRED VACUUMING AND SWEEPING TO REMOVE LOOSE SCALE AND DEBRIS. THE REMAINDER OF THE CLEANING WAS IN ISOLATED AREAS THAT HAD SLUDGE BUILD UP IN THE CENTER OR SIDE DOWNCOMERS. SOME MINOR HOLE PLUGGING OF THE SIEVE TRAYS WAS FOUND, PREDOMINATELY AT THE TOP SECTON OF THE COLUMN WHERE THE HOLE SIZE WAS REDUCED FROM ITS NOMINAL DIAMETER OF 1/2" TO 3/8". NO REPAIR WORK WAS RECOMMENDED TO ENLARGE THE HOLES AS THEY ARE IN ISOLATED AREAS. THE TOP HEAD AND TRAYS 48-44 HAVE APPROX. 1/16" OFSCALE ADHERED TO THE SHELL WITH ISOLATED AREAS UP TO 1/4" THICK. TRAYS 44-40 HAD 1/16 TO 1/8" OF SCALE ON THE SHELL. TRAYS 39 TO 33 HAD NO SCALE BUILD UP. TRAY 32 HAD 1/8" SCALE ON SHELL. TRAYS 5-1 HAD 1/4" OF SCALE ON THE SHELL. ULTRASONIC GAGE MEASUREMENTS WERE TAKEN AT EACH TRAY LEVEL AND ON THE BOTTOM HEAD AND NO SIGNIFICANT CORROSION HAS TAKEN PLACE SINCE THE PREVIOUS

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

INTERNAL INSPECTIONS. THE TOP HEAD WAS NOT U.T. GAGED AS THERE WAS NO STAGING ERECTED AND INSPECTION FROM THE TRAY LEVEL INDICATED NO APPARENT CORROSION ALTHOUGH THE HEAD WAS HEAVILY SCALED. ULTRASONIC GAGE MEASUREMENTS WERE ALSO TAKEN AT RANDOM LOCATIONSON ALL TRAYS WITH NO SIGNIFICANT CORROSION EVIDENT. THE MINIMUM TRAY GAGE WAS 0.10". THE IMPINGEMENT PLATE AT THE FLASH ZONE WAS AGAIN BULGEDAWAY FROM THE SHELL AND THE STITCHWELDS ALONG THE BOTTOM WERE CRACKED. REPAIRS WERE MADE BY JACKING THE PLATE BACK AGAINST THE SHELL AND WELDING ALONG THE BOTTOM LEAVING 1" GAP IN THE WELD METAL TO ALLOW DRAINAGE OF ANY STOCK THAT GETS BEHIND THE PLATE. THE TOP TRANSFER LINE WAS INTERNALLY INSPECTED FROM THE COLUMN INLET NOZZLE TO THE FIRST VERTICAL ELLS ON THE 24" SECTIONS NEAR THE FURNACES. A LOT OF TIME WAS TAKEN UP BECAUSE THE CONTRACTOR HAD DIFFICULTY REMOVING WATER AND SLUDGE FROM THE LINE. THEY HAD TO BE SENT BACK SEVERAL TIMES TO REMOVE ADDITINAL WATER AND SLUDGE. THE FINAL INSPECTION WAS STILL MADE IN APPROXIMATELY 1/2" OF WATER. NO SIGNIFICANT EROSION / CORROSION HAS OCCURED SINCE THE LAST INTERNAL INSPECTION. THE FOLLOWING REPAIRS WERE COMPLETED THIS S/D: TRAY NO. 45 - REPOSITIONED AND TIGHTENED TWO LOOSE FLOW DEFLECTORS. TRAY NO. 44 - REPOSITIONED AND TIGHTENED TWO LOOSE FLOW DEFLECTORS NEAR THE INTERNAL MANWAY ON THE EAST SIDE OF THE TRAY. TRAY NO. 43 - REPOSITIONED AND TIGHTENED ONE LOOSE FLOW DEFLECTOR ON THE WEST SIDE OF THE TRAY. TRAY NO. 42 - REMOVED AND STRAIGHTENED TWO BENT TRAY SUPPORT BEAMS ON THE SOUTH SIDE OF THE COLUMN, STRAIGHTENEDFOUR BENT TRAY SECTIONS, REPOSITIONED THE SECTIONS AND RE-INSTALLED THE TRAY HOLD DOWN BOLTING. TRAY NO. 41 - BROKE THE FLANGE AT THE 10" NO. 1 S/C DRAW OFF BOX AND REMOVED APPROX. 1" OF STANDING WATER AND DEBRIS FROM THE BOTTOM OF THE BOX. REPLACED FOUR MISSING BOLTS ON THE SOUTH WEST CORNER OF THE CENTER DOWNCOMER BOX FROM TRAY NO. 40. TRAY NO. 35 - REMOVED AND STRAIGHTENED FOUR BENT SUPPORT BEAMS UNDER THE TRAY, STRAIGHTENED THE FOUR BENT TRAY SECTIONS, REPOSITIONED THEM AND RE-BOLTEDINTO PLACE. TRAY NO. 34 - CLEANED APPROX. 1" OF BLACK SLUDGE FROM THE CENTER AND SIDE DOWNCOMER BOXES. TRAY NO. 20 - REPLACED EIGHT TRAY HOLD DOWN CLIPS ON THE NORTH SIDE DOWNCOMER FROM TRAY NO. 19. REPLACED FIVE MISSING BOLTS ON THE CENTER DOWNCOMER ADJACENT TO THE INTERNAL MANWAY. TRAY NO. 19 - CLEANED APPROX. 1" OF SLUDGE FROM THE CENTER DOWNCOMER. TIGHTENED ALL TRAY HOLD DOWN BOLTS. TRAY NO. 18 - CLEANED A 3" LAYER OF DIRT AND SCALE FROM THE TRAY. TRAY NO. 15 - CLEANED APPROX. 1" OF SLUDGEFROM THE CENTER DOWNCOMER. TRAY NO. 12 - CLEANED APPROX. 1" OF SLUDGE FROM THE CENTER DOWNCOMER. TRAY NO. 9 - JACKED UP THE 8" INLET SPARGER TO PROVIDE A NEW CENTER SUPPORT AND REGASKETED THE INTERNAL FLANGE. THE FLANGE CRACKED WHILE BEING TIGHTENED AND REQUIRED WELD REPAIRS TO THE SPARGER TO FLANGE ATTACHMENT WELD. FLASH ZONE - JACKED THE BULGED IMPINGEMENT PLATE BACK AGAINST THE SHELL AND WELDED ALL ALONG THE BOTTOM WITH THE EXCEPTION OF 3-1" WIDE AREAS FOR DRAINAGE. WELDING WAS DONE WITH INCO 182 WELD ROD. REPLACED THREE MISSING CENTER TRAY SECTION BOLTS. REPLACED TWO MISSING BOLTS ON EACH OF THE TWO CATCH BASINWEIRS. REPOSITIONED THE CENTER WEIR AND INSTALLED NEW WICKING WHERE IT HAD FAILED UNDER THE CHIMNEY ASSEMBLY ON THE WEST SIDE OF THE COLUMN. TRAY NO. 2 - REPLACED ONE MISSING TRAY HOLD DOWN CLIP AND TIGHTENED THREE OTHERS ON THE SOUTH SIDE OF THE COLUMN. REPLACED TWO MISSING BOLTS ON THE CENTER TRAY SECTION. TRAY NO. 1 - REMOVED SIX TRAY CLIPS FROM THE TRAY, CLEANED COKE BUILT UP FROM THE UNDERSIDE AND REPOSITIONED THE TRAY SECTIONS AND RE_CLIPPED. BOTTOM HEAD AREA - CLEANED THE BUILT UP BLACK SLUDGE FROM THE BOTTOM 1/3 OF THE VORTEX BREAKER SCREEN. NEXT S/D: POSSIBLE REPAIRS TO TRAYS 3 & 4 WHICH WERE SLIGHTLY BENT WITH GAPS IN THE PLATES IN THE SIDE DOWNCOMER AREA. IF THIS COLUMN OPERATES NORMALLY IT IS RECOMMENDED THAT IT BE GIVEN AN INSPECTION FREQUENCY OF TEN YEARS.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	8/5/1985	**Date Available:**	
History Brief Date:	08/05/1985	**History Brief ID:**	HB-0207076431
Event Type:	Repair	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	INTERNAL / ROUTINE		

Reliability Analysis:

Event Type:	Repair	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Internals
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JDYO
Save:		**Inspected By:**	

Findings:

PCA ID:	PCA-002023617	**Condition:**	
Inspectable:	GENERAL	**Action:**	Replaced "In-kind"
Sub Item:		**Location:**	
Part:	INTERNALS	**Damage Mechanism:**	
Discussion:		**PCA Work Order No :**	

PCA ID:	PCA-002023618	**Condition:**	
Inspectable:	GENERAL	**Action:**	Repaired
Sub Item:		**Location:**	
Part:	INTERNALS	**Damage Mechanism:**	
Discussion:		**PCA Work Order No :**	

Reliability Comments:

MAJOR S/D The column was steamed out and opened at all external MWs. The Internal MWs were opened only between trays 1-5 and 18-37. All areas available for inspection were visually and ultrasonically inspected (top head not gaged - no staging). Trays 19, 20, 21 and the collector tray below tray 19 were corroded thin (0.05" to failure). All four (4) trays were replaced (mat'l is now 410 S.S.). The downcomers wre also replaced (holed through and thin throughout) (New downcomer mat'l and all bolting is 316L). The corrosion seemed to be the heaviest at the collector level.Close inspection of the shell (after trays had been removed) showed no loss of wall in this area. At least 1/2 of the bolts in trays 1-5 were severely corroded and near failure (wrong mat'l used at '82 S/D - see previous records). Several tray and downcomer angle supports (approx 10-12) were broken loose and distorted. Many weirs were missing corner brackets and the downcomers (center) between trays 1 and 2 were sagging in the middle cutting off almost all flow to the trays. Many (approx 200)tray clips were loose and out of position. These trays and

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

downcomers (1-5) have been upset in the past and at best can now be described as being in only fair condition. Plans should be made (mat'l ordered) for the possible replacement of trays 1-5 at the next major S/D. The inlet impingment plate (flash zone) was found to be bowed out in (3) areas. The (3) bowed areas were carefully removed (air-arc) and the shell and cladding behind checked carefully for signs of corrosion -none was found.A layer of coke (3/8" thick) had built up behind the impingment plate. The bottom of the plate was completely welded allowing no drainage of trapped stock. New plate (approx 200 sq ft of 410 S.S.) was welded in place. A skip weld was used along the bottom edge (weld rod was E309-15 and all weirs were ground smooth. TOP HEAD: Top head was not UT gaged due to no staging (should be staged at next S/D) vapor horns UT'd 0.61" and 0.60" (6 to 10 MPY), sparger noz.0.66" - no loss. Top head nozzle 0.70" (13 MPY loss) a moderate layer of soft scale (approx 1/8" to 1/4" thick) covered the shell, tray and refluxpiping. TRAY 48: Moderate scale throughout. Tray thickness was 0.12" and sieve holes measured 0.480" dirty and 0.488" clean. Shell gaged 0.67" to 0.70".Replaced (1) upset flow dam and tightened (1) other. Corrosion coupon rack sent to mat'l lab and new rack installed. TRAYS 47-38: Not opened this S/D. CONICAL SECTION: Shell gaged 0.64" to 0.76". No significant corrosion. 10" reflux return noz. 0.56", sparger nozzles 0.56" to 0.61". No loss. No repairs required. TRAYS 37 TO 35: No significant corrosion seen. Mild cleaning of trays (scale and debris). No repairs. COLLECTOR TRAY (below TRAY 35): Cleaned approx 1" of scale and debris from downcomers. TRAYS 34 TO 22: No corrosion seen, mild cleaning of scale all trays. No repairs necessary. Tray thickness 0.14" max to 0.12" min. Sieve holes 0.475" dirty to 0.495" clean. 12" vapor return noz. at tray 22 gaged 0.75" (0.76" in 1982 - 3 MPY loss). TRAYS 21, 20, 19 and COLLECTOR TRAY below Tray 19: All trays replaced (corroded thin 0.07" to 0.09" and holed through in approx 8 to 10 areas).Replaced tray support beams also. Tray mat'l is 410 S.S., downcomer mat'lis 316L, all tray hardware (clips, bolts, etc) is 316L or 410 S.S. No significant corrosion to shell behind old trays. TRAYS 18 TO 6: Not available to inspection this S/D. FLASH ZONE: Replaced approx 200 sq ft of bowed inlet impingment plate (new mat'l is 410 S.S. - weld rod was E-309-15) bottom edge of plate was skip welded. The 32" tranfer line was internally inspected from the flashzone inlet to the 2nd 24" ells on the way to F-1100 A & B. One (1) pipe weld (eroded) was ground flush with the parent metal (approx 5" long). Approx 20 areas (within striplined sections) were found to have multiple pinholes. Reco to grind out and reweld the worst areas (each about 1/2"x 1" long) was deferred by engineering (Nick Lavanos) See piping book, Sys 2, Dwg 17 for location of problem areas and further information on this line inspection. UT range in Flash Zone Shell was 1.53" to 1.66". No significant corrosion. Corrosion coupon rack sent to mat'l lab for analysis and new rack installed (just inside manway at flash zone). TRAY 5: UT 1.66" to 1.78" - no corrosion. Rewelded (2) tray flanges. Lap patched two (2) holes (approx 1"x3" each) in collection pan. Replaced (3) tray retaining clips. Replaced two (2) bent and badly distorted angletray supports (new mat'l is 316L bolts). TRAY 4: Installed (4) downcomer supports (approx 4"x3"x1/4"). Replaced (2) broken angle supports (1/8"x2"x53" long). Replaced (1) overflow weir angle bracket and (2) bolts. Installed (4) downcomer supports. Replaced approx 100 corroded C.S. tray bolts with new 316L mat'l. TRAY 3: UT 1.62" to 1.75" - No loss seen. Straightened (1) manway angle. Replaced (3) angle supports (tray) (missing). Replaced 2 missing bolts (316L) at tray support beam to shell connection. Replaced approx 100 C.S.tray bolts with new 316L bolts. TRAY 2: Repositioned the sagging center downcomer and straightened (4) downcomer supports. Replaced (2) damaged corner angle brackets. Jacked tray #1 away from center downcomer and installed (4) new support braces. Replaced approx 100 C.S. tray bolts with new 316L bolts. Replaced (2) missing tray support beam bolts. TRAY 1: Weld repaired (1) cracked and distorted tray flange. Relocated south tray to shell connection and rebolted same. Rewelded the broken loose main beam connection to the shell (South end). Installed (2) missing corner brackets from overflow weir. Replaced approx 100 C.S. bolts (corroded) with new 316L bolts. BOTTOM HEAD: Vortex breaker was removed and cleaned (approx 30% plugged off). Bottom head noz UT 0.55" - no loss. Cleaned loose scale and debris from bottom head. Bottom head 1.88"-1.90" UT. NEXT S/D: Possible replacement of trays 1-5 due to many past upsets and repairs. Stage top head for UT inspection (no readings to this date). ADDITIONAL UT READINGS:1 S/C noz 0.58"; Cone Section - 10" ATCR return noz 0.56", 10" ATCR return noz (North) 0.56", 12" vapor returns (2) 0.70"; 2 S/C draw (24") 0.72"; 10" C-1130 vapor return noz 0.56; 8" 3 S/C 0.56"; 12" vapor return noz to C-1140, 0.70";8" (2) ABCR return from P-1148's, 0.59" and 0.60"; 4 S/C draw (20") 0.60"; 5 S/C draw (12") 0.56"; 5 S/C PA (6") 0.54"; 10" vapor return to v-1103, 0.54"; (2) 8" stripping stm (1st deck) 0.56", 0.54; 4" c-1160 O F return 0.54"; LT 11002" (1st deck) 0.54"; FT 1104 2" (1st deck) 0.64"

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	3/19/1984	**Date Available:**	
History Brief Date:	03/19/1984	**History Brief ID:**	HB-0207076430
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	INTERNAL / ROUTINE		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

Flash zone area at transfer line elevation made available for inspection only. Column was in good condition. Tray and bolting indicate very littlecorrosion taking place at this inspection. Only one tray inspected due toavailability.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	4/19/1983	**Date Available:**	
History Brief Date:	04/19/1983	**History Brief ID:**	HB-0207076429
Event Type:	Repair	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	INTERNAL / REPAIR		

Reliability Analysis:

Event Type:	Repair	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Internals
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	PCA-002023616	**Condition:**	
Inspectable:	GENERAL	**Action:**	Replaced "In-kind"
Sub Item:		**Location:**	
Part:	INTERNALS	**Damage Mechanism:**	
Discussion:		**PCA Work Order No :**	

Reliability Comments:

Flash zone area available for inspection due to required repairs to transfer line. Approx 50% of the tray bolts were corroded thin or had failed. Most of these bolts were replaced at this time. The bottom 4 trays, repaired or replaced during the 7-19-82 S/D, may also have the wrong bolting material and extensive work should be anticipated in this area next S/D. Not made available for inspection at this inspection date.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	7/19/1982	**Date Available:**	
History Brief Date:	09/11/2002	**History Brief ID:**	HB-0209079115
Event Type:	Information	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	S/D		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

9/11/2002 2:54:18 PM
Entered By: Coral Miller

Major S/D: The column was ultrasonicaly and visually inspected after all external and internal m/w's were opened ultrasonic gage readings obtained at every tray level revealed no significant metal loss from previous inspection 3/78 visual inspection revealed the bottom 5 trays to be upset when column was opened. Extensive repairs had to be made to all 5 trays with several tray sections being replaced with 304 or 405 SS gage readings obtained on trays 19-21 revealed a 7 mpy corrosion rate for Tray 19 and a nil rate for Trays 20 and 21. The sieve tray holes on all three trays have enlarged from 0.55" to 0.60" on Tray 21 and 20 and from 0.57" to 0.62" on Tray 19. At the present rate of corrosion the trays should make a 2 yr run. Possible replacement next S/D. New tray sections are in interim storage.
Top Head: Top hd not UT gaged due to lack of staging. Vapor horns UT gaged 0.64" and 0.62". Sparger nozzle gaged 0.66". Top hd nozzle 0.74" moderate layer of scale on shell with no significant corrosion noted. Replaced 1 missing tray hold down clip.

Tray 47
Light layer of scale on shell. Cleaned approx 6" of dirt and scale from corners of both side D/C boxes. No major repairs required.

Tray 46
Light layer of scale on shell repositioned, 1 loose tray support crossmember, no major repairs required.

Trays 45-43
No repairs required mild cleaning on all trays.

Tray 42
Minor cleaning on tray. No repairs. The 14" vapor return nozzle UT gaged 0.96" min.

Tray 41-39
No repairs required. Minor cleaning on all trays.

Tray 38
Replaced 2 missing bolts in tray support beam, no major repairs.

Conical Section
No significant corrosion. 12" vapor return = 0.74", 10" reflux return nozzles = 0.60". Sparger nozzles gaged 0.52" on south side and 0.58" on north. No repairs required.

Trays 37-27
No repairs required. Mild cleaning on all trays.

Tray 26
No repairs. 10" vapor return nozzle gaged 0.60"

Trays 25-23
No repairs. Tray thickness and diameter of holes are same as previous inspection.

Tray 22
Replaced 1 missing tray wier and repositioned 1 loose wier located south side of center d/c box. Tray thickness gaged 0.13". Tray holes gaged from 0.50" to 0.525". 12" vapor return nozzle UT gaged 0.76" previous S/D gage reading 1.13". Check nozzle when plant comes down next.

Tray 21
Sieve tray thickness gaged 0.10". Tray holes gaged a max of 0.60". Possible tray replacement next S/D. The distributor piping gaged 0.51". The 2-8" reflux return nozzles gaged 0.60".

Tray 20
Tray thickness gaged 0.09". Tray holes gaged a max of 0.60". Possible tray replacement next S/D, no repairs this S/D.

Tray 19
Tray thickness gaged 0.09". Tray holes gaged a max of 0.62" possible replacement next S/D. No repairs required this S/D.

Collector Tray
Installed (3) 12" x 12" lap patches on failed tray sections tray UT gaged 0.10". Tray had approx 2' of sludge and dirt that had to be cleaned off before inspection.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Tray 18 to 7
No repairs requried this inspection.

Tray 6
Repositioned buckled center D/C box cleaned light layer of dirt and debri from tray.

Flash Zone
Tray out of position when column was opened. All upset tray sections were repaired. Rewelded cracked impingement plate attachment welds. The 32" inlet nozzle that falied 3-13-82 was weld built and ground smooth using E-502-15 rod with the final pass being made with E-309 MD. Line was stress relieved at 1325-1400 deg F for 2 hrs after all repairs were made (see EWO #L-432-<1> 13 S/D folder).

Trays 5-1
All upset trays were repaired with some tray sections replaced with 304 or 405SS. Shell appeared to be in good condition with only a light layer of scale noted.

Bottom Head
Mild scale on shell section. Removed the coke deposits from vortex breaker and two bottom rams horns. Cleaned loose nuts, bolts, dirt and debris from bototm hd. Btms nozz UT .052" - mating ell internally SS alloy weld overlayed.

Next S/D
Possible replacement of Trays 19-21 and collector tray below 19. The nozzle on Tray 22 should be UT gaged, possible repairs may be required. All internally clad nozzles were visually inspected and no corrosion or erosion was noted. All corrosion coupons were delivered to materials lab. Did not install replacement coupons.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	3/13/1982	**Date Available:**	
History Brief Date:	09/11/2002	**History Brief ID:**	HB-0209079114
Event Type:	Information	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	S/D		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

9/11/2002 2:47:41 PM
Entered By: Coral Miller

Plant S/D due to leak at 32" nozzle to transfer line weld. Nozzle internal cladding seal weld failed 360 deg at carbon steel nozzle to 5 cr piping connection. Installed 360 deg /zpp patch over failed and thin weld. Make permanent repairs during the 5-1982 S/D. Radiographed cladding welds for 5 s/c, flash drum vapor inlet, bottoms outlet and 18th Tray by-pass nozzles. All welds were OK. Inspect all cladding and lined nozzles during 5-1982 S/D. The 20" 4 s/c nozzle UT gaged 0.58 RWT.

History Brief

For Location ID: C-1100 in Unit: 0955

Report Date: August 18, 2012 | Data Source: Meridium

Brief Data:

Date Not Available:	3/13/1978	**Date Available:**	
History Brief Date:	09/11/2002	**History Brief ID:**	HB-0209079113
Event Type:	Information	**In- Service Date:**	
Equipment ID:	C-1100	**Critical:**	L
Asset ID:	D-5871	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	251	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	S/D-Internal Inspection/Int Fire/Minor Repairs Reqd		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Shell
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

9/11/2002 2:07:18 PM
Entered By: Coral Miller

Major S/D: The column was steamed and opened at the top and bottom. Air was blown thru the column to cool it down. Approx 2 hours later a flame-less fire broke out in the column due to pyrophoric iron sulfides. The column was then water washed for approx 48 hours allowing the iron sulfides to oxidize at a controllable rate. All external and internal manways were opened for inspection. We UT gaged and inspected at every tray level using 2 or 3 - 2 man crews. It took approx 32 hours.
Top Head - moderate scale over like new parent metal in shell section. Top head was not gaged due to no staging.
The vapor horns (2) and spargers were in good condition. The 8" sparger header gaged 0.66" min.
Tray 48 - moderate scale. Sieve tray holes gaged 0.49 and 0.50". No corrosion noted.
Tray 47 - Ditto
Tray 46 - Ditto
Tray 45 - Ditto
Tray 44 - Ditto
Tray 43 - Ditto
Tray 42 - Ditto, the 14" vapor return nozzle gaged 0.97" min wall.
Tray 41 - mild scale. No corrosion. 1/2" layer of mud in total draw off tray was removed. The 12" total draw off

nozzle gaged 0.60" min wall.
Tray 40 - mild scale. No corrosion. Sieve tray holes gaged 0.50"
Tray 39 - Ditto
Tray 38 - Ditto, 4 missing "I" beam tray support bolts were replaced.
Transition Section - mild scale. No corrosion. The 12" vapor return nozzle gaged 0.72". The 10" reflux return nozzle gaged 0.60". The 10" reflux sparger gaged 0.54" - 0.61" on the south and 0.58" - 0.63" on the north side.
Tray 37 - mild scale. No corrosion.
Tray 36 - Ditto
Tray 35 - Ditto
Collector Tray - ditto. Small scale deposit on the north half of tray was removed.
Tray 34 - mild scale. No corrosion.
Tray 33 - Ditto
Tray 32 - Ditto
Tray 31 - Ditto
Tray 30 - Ditto
Tray 29 - Ditto
Tray 28 - Ditto
Tray 27 - Ditto
Tray 26 - Ditto The 10" vapor return nozzle gaged 0.58" min.
Tray 25 - mild to moderate scale noted.
Tray 24 - moderate scale noted. Some reduction in sieve tray holes due to scale 7/16" dirty 9/16" clean, this sale and corrosion on the trays gets worse until Tray 18.
Tray 23 - moderate to heavy scale. No corrosion on the shell. Original thickness of tray was 0.14" and now 0.135" corrosion rate 3 mpy. Original sieve tray holes was 0.50" dia and now 0.52" dia.
Tray 22 - heavy scale. 12" vapor return nozzle gaged 1.13" min. No corrosion on the shell noted just heavy scale. Sieve tray original thickness was 0.14" and now 0.125" corrosion rate 9 mpy. Sieve tray holes gaged 0.53" clean and approx 0.375" dirty.
Tray 21 - heavy scale. The 2' - 8" reflux return nozzles gaged 0.59" the reflux distributor gaged 0.51". No corrosion on the shell noted. Sieve tray gaged 0.108" thickness corrosion rate 19.2 mpy. Sieve tray holes gaged 0.546" dia.
Tray 20 - 1/10" scale on the shell no corrosion noted sieve tray gaged 0.09" thick corrosion rate 25 mpy. Sieve tray holes gaged 0.55", orig was 0.50". (Note in margin: 3.6 years total failure.)
Tray 19 - 1/16" scale bonded very tight to shell. Corrosion very bad on bolts, down comers, and tray. Sieve tray gaged 0.09" thick corrosion rate 25 mpy. Sieve tray holes gaged 0.565" dia.
Collector tray - general corrosion on tray and components at 13.2 mpy tray gaged 0.110". No corrosion noted on the shell. The collector draw off was not working before the shutdown. Approx 6" sludge noted on this tray.
Tray 18 - type 410SS cladding starts 12" above this tray. The shell above the cladding has 1/4" sludge and scale with no corrosion noted. The sieve tray is like new.
Tray 17 - no scale no corrosion, (1) one cracked tray support ring skip weld was repaired.
Tray 16 - Ditto except (2) two cracked skip welds were repaired.
Tray 15 - Ditto except (10) ten cracked skip welds were repaired.
Tray 14 - Ditto except (5) five cracked skip welds were repaired.
Tray 13 - Ditto except (19) nineteen cracked skip welds were repaired.
Tray 12 - mild scale no corrosion. Sieve tray holes measure 0.50".
Tray 11 - Ditto, 2" hot tap on south west side was not completely drilled thru. The hot tap was finished off and the cladding welded to the nozzle.
Tray 10 - mild scale no corrosion.
Collector Tray - mild scale, no corrosion. Approx 2" of sludge build up was removed.
Tray 9 - mild scale no corrosion. The 6" distributor pipe flange was replaced at the first flange from the column shell.
Tray 8 - no scale or corrosion.
Tray 7 - Ditto

History Brief

For Location ID: C-1100 in Unit: 0955

Chevron

Report Date: August 18, 2012 Data Source: Meridium

Tray 6 - Ditto
Tray 5 - Ditto, north manways on internals were not opened for inspection.
Collector Tray - no scale or corrosion. 3 hold down bolts and 1 clip was missing and replaed. The 32" feed inlet gaged 0.38" min.
Tray 4 - Ditto Tray 5
Tray 3 - Ditto
Tray 2 - Ditto
Tray 1 - Ditto
Bottom Head - cleaned 6" mud and water, tack welded vortex breaker.
Column External - UT gaged rams horns all okay. Air tested TE-11051 thermowell nozzle at 10 psig. Recommended installation of non skid surface on all deck plate around the column.
Column Internal - all sieve trays and holes were cleaned of scale deposits. Removed down comer inlet weirs on Trays #14 thru #18, #22 thru #24 and #26 thru #32 this shutdown to promote more column thru put. This in combination with the original design leaves Trays #47 thru #14 without inlet weirs. Bypassed Tray #18 and #34 by cutting their outlet weirs, blanking off 34" of sieve holes and installing a vapor riser on each internal manway of Trays #18 and #34.
Next Shutdown - replacement of sieve Trays; #19, #20, #21, #22 and collector tray above Tray #18 with an alloy SS should be considered due to high corrosion rates. Also consider strip lining the shell in the same area if corrosion warrants.